Resistance to *Pseudomonas syringae* pv. *tomato* and *Xanthomonas campestris* pv. *vesicatoria* in wild *Lycopersicon* species

by

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TABLE OF CONTENTS

INTRODUCTION

The cultivated tomato, *Lycopersicon esculentum* Mills., has become one of the most important vegetable crops in the United States. In 1979, approximately 8,447,400 tons of tomatoes valued at $1,013,329,000 were produced on 440,040 acres (101). This suggests a mean production of 19.2 tons per acre worth $120 per ton. In addition, were the large numbers of tomatoes grown in home gardens throughout the country.

Although classified as a vegetable, tomato plants are grown almost exclusively for their fruits, which are eaten fresh, cooked, or as a processed constituent in a wide variety of foods. In 1978, U.S. per capita consumption of commercially produced tomatoes was estimated to be 35.3 lbs (61). Because tomatoes are consumed in such large quantities, they are a major nutritional component of our diet (78).

Plant disease is one of the most serious problems facing tomato producers each season. Of major importance are two widely occurring tomato diseases, bacterial speck caused by *Pseudomonas syringae* pv. *tomato* (Okabe) Alstatt, and bacterial spot caused by *Xanthomonas campestris* pv. *vesicatoria* (Doidge) Dowson.

Both diseases produce lesions on tomato leaves, stems, flower parts, and fruits. Severe field infections, at any stage of crop development, may result in a reduction of fruit yield and quality (102).

Infection of the tomato plant by bacterial pathogens is encouraged by the presence of water (60). Strong winds, driving rain, and other conditions that cause plant wounding have also been positively correlated with disease epidemics (103). Bacterial spot is considered a warm season

disease, while bacterial speck has been more prevalent under cooler temperatures (42).

Control measures include crop rotation, use of pathogen-free seed and transplants, and applications of bactericidal compounds. However, none of these measures is 100 percent effective. Control by genetic resistance has not been widely used due to a lack of commercially acceptable resistant cultivars. Breeding for bacterial spot resistance has been stymied by the lack of a good source of resistance (27, 28, 104). Monogenic resistance to bacterial speck has been recently reported by Pitblado and Kerr (75) and is being used in several breeding programs.

This project was initiated to systematically evaluate the Plant Introduction collection of *Lycopersicon* for sources of resistance to bacterial spot. During these evaluations, a survey of the genus was also made for bacterial speck resistance by screening selected lines. After finding bacterial speck resistance in two Plant Introduction (PI) lines, *L. pimpinellifolium*, PI 112215, and *L. hirsutum f. glabratum*, PI 129157, they were used in a diallel cross with two *L. esculentum* cultivars, Chico III (susceptible) and Ontario 7710 (resistant). Evaluation of the F_1 and F_2 progeny provided information on the mode of inheritance of the resistance and whether the three different sources of resistance were based on the same set of genes or not.

LITERATURE REVIEW

The Host

The center of distribution for the *Lycopersicon* genus is along the western coastal region of South America and the Galapagos Islands (78). The species *L. esculentum* and, to a lesser extent, *L. pimpinellifolium*, have a long history of cultivation and, consequently, have been spread to many parts of the world.

All *Lycopersicon* species have 12 pair of chromosomes. Based on morphological characters, *Lycopersicon* species may be naturally divided into 2 subsections or subgenera (62, 68).

I. *Eulycopersicon* contains 2 species, the more familiar *L. esculentum* Mill. and the closely related red currant tomato, *L. pimpinellifolium* (Jusl.) Mill. These 2 species are annual, mainly self-pollinating and will hybridize readily, producing viable and fertile progeny. At maturity, they bear red, orange, or yellow glabrous fruit containing the carotinoid pigments, lycopene and carotin.

II. *Eriopersicon* contains the remaining *Lycopersicon* species which are more or less perennial, woody-stemmed wild species found in western South America. These species generally cross-pollinate and bear small, greenish-white fruits, often tinged or mottled with purple. The fruits contain both chlorophyll and anthocyan pigments at maturity.

The following species are members of the *Eriopersicon*.

Lycopersicon cheesmanii f. *minor* (Hook) C. H. Mull. is endemic to the Galapagos Islands and has yellow to orange colored fruit. It crosses

with *L. esculentum*, but the resulting progeny are subject to reduced viability and fruitfulness (79). *Lycopersicon peruvianum* (L.) Mill. and its botanical varieties, *dentatum* Dun. and *humifusum* Mull., are found along the dry coastal regions of South America. Crosses to *L. esculentum* have been achieved with the help of embryo culture techniques (88, 98). *Lycopersicon glandulosum* Mull., *L. hirsutum* Humb. and Bonpl., and *L. hirsutum* f. *glabratum* Mull. are found at higher elevations in western South America and are characterized by large robust plant size and small green fruits. These species will cross to *L. esculentum* and *L. pimpinellifolium* without difficulty, providing they are used as pistillate parents (62, 77).

Sawant (81) has reported a semilethal complementary factor in hybrids between *L. esculentum* and *L. hirsutum* f. *glabratum*. F_1 plants and F_2 segregates possess a withering phenotype where branches turn pale and droop as if under a water stress. The symptoms gradually progress down the branch, eventually killing it. New branches arising from the base of the plant produce normal growth for a short period of time before showing symptoms. This phenotype is controlled by the complementary interaction of nonallelic genes from both parents.

Large collections of *Lycopersicon* germplasm are maintained by the Asian Vegetable Research and Development Center (AVRDC) at Shanhua, Taiwan, Republic of China, and the U.S. Department of Agriculture's North Central Regional Plant Introduction Station at Ames, Iowa. Both of these collections contain over 4,500 accessions including representatives of each *Lycopersicon* species, numerous breeding lines, and named cultivars. A smaller, more specialized collection of tomato species, genetic, and cytological

lines is maintained by the Tomato Genetics Stock Center, Department of Vegetable Crops, University of California at Davis (79).

Bacterial Spot

Bacterial spot of tomato is reported to exist in most of the tomato producing regions of the world, including the United States (35). In Florida, where warm, wet growing conditions are conducive to bacterial spot development, average annual disease losses have been estimated at 10% with individual losses up to 100% (25). In Georgia, the disease can be a serious problem in field-grown tomato transplants. Infections have been responsible for denials of phytosanitary certification (64). A report by Kennedy and Alcorn (50) estimated that growers in the U.S. lost 1.5 million dollars in 1976 due to bacterial spot of tomato.

In 1921, Miss Ethrel Doidge (33) described *Bacterium vesicatorium*, a pathogen causing leaf and fruit spotting of tomatoes in South Africa. In the U.S., at about the same time, Higgins (45) described a bacterium which caused bacterial spot of peppers, and Gardner and Kendrick (38) described a bacterium which caused bacterial spot of tomatoes in Indiana. Further study by Gardner and Kendrick (38) suggested that these 3 causal agents possessed identical taxonomic and chemical features and should be assigned the name *Bacterium vesicatorium* Doidge.

In 1939, a restructuring of the classification and nomenclature of plant pathogenic bacteria occurred. The genus *Xanthomonas* was created and contained the species causing bacterial spot of tomatoes and peppers, *X. vesicatoria* (Doidge) Dowson (as cited in Elliot (35)).

Xanthomonas vesicatoria is a plant pathogenic, gram negative, motile, rod-shaped bacterium having a single polar flagellum. It has no known resting stages and is almost always found in association with plant material. It produces convex, shiny yellow, mucoid colonies on many media (13, 34).

Foliar symptoms appear as irregular to circular shaped greenish-yellow to brown spots, at first having a water-soaked appearance, but soon becoming necrotic. Depending on environmental conditions, leaf lesions 1-5 mm in diameter become visible within 4 to 14 days after infection. A chlorotic halo is sometimes observed around the lesion. Severely infected leaves will soon become chlorotic and drop, contributing to defoliation of the plant (7, 34, 102).

Infection is not limited to the leaves; asymmetric, brownish spots may also be found on stems, petioles, and flower parts. These infection sites will sometimes split open, providing a port of entry for other organisms. Severe infection of flower parts may also cause blossom drop (34, 102). One of the most striking symptoms of bacterial spot is the large scab-like lesions on the fruit. Small, water-soaked spots appear first, then gradually enlarge and become slightly raised. The spots eventually become dark brown in color and form a rough, scabby surface. Spot centers are usually sunken slightly. The lesions occur mainly on the epidermis and do not extend deeply into the fruit. Fully mature fruit spots range from 1-6 mm in diameter. Spots may coalesce to form large scabby areas when many fruit infections occur. Young, developing fruits that become severely infected will remain small and malformed (57). From the breaker

stage on, fruits appear to be immune to infection and spot development (38, 102).

The reported host range includes the following: *Datura stramonium*, *Hyoscyamus* spp., *Lycium* spp., *Lycopersicon* spp., (tomato), *Nicandra physalodes*, *Nicotiana rustica*, *Physalis minima*, and *Solanum* spp. (including bittersweet, black nightshade, buffalo bur, and potato) (13, 34, 38). However, Laub and Stall (58) found that *Solanum nigrum* (black nightshade) and *Physalis minima* (ground cherry) were actually resistant to infection by *X. vesicatoria*. When these two reported hosts were inoculated with high concentrations of the bacterium, they developed symptoms of a hypersensitive response, similar to that of resistant pepper lines. However, the study indicated that the bacterium may survive as a resident on the plants.

Xanthomonas vesicatoria is also responsible for causing bacterial spot of pepper which affects the foliage and developing fruit of pepper plants (34, 45). Epidemics of bacterial spot have been associated with prolonged wet weather and wind driven rain. Disease development early in the season results in stunted, nonproductive plants. Epidemics later in the season can cause fruit scabs and plant defoliation, which increases fruit sunscald and reduces marketable yield. Control of the disease has been difficult (52, 96, 99).

Movement of the pathogen from pepper to tomato and vice versa is possible. Cook and Stall (21) have identified different pathogenic races among isolates of the bacterium. This pathogenic specificity appears subject to mutation (29).

Bacterial Speck

Bacterial speck of tomatoes can be a serious problem on both fresh market and processing tomatoes (102). The disease is world-wide in scope and has been most severe where cool, wet growing conditions prevail (11, 42, 76, 83, 89, 109). Research by Schneider et al. (85) has shown that epidemics of bacterial speck may delay maturity and reduce the yield of field-grown processing tomatoes by 13%. Yunis et al. (109) found that infections early in the season could reduce yields up to 75% while later infections resulted in limited yield losses. Fruit infection and lesion formation may interfere with whole-pack tomato skin removal (51, 72).

In 1933, the causal agent of bacterial speck of tomato was described, almost simultaneously, by Okabe (70) in Formosa, and Bryan (12) in the U.S. Okabe identified the pathogen as *Bacterium tomato*, while Bryan used the binomial *Bacterium punctulans*. By the 6th edition of *Bergey's Manual of Determinative Bacteriology*, some of the confusion in classification and nomenclature had been settled and the pathogen was listed as *Pseudomonas tomato* (Okabe) Alstatt with *P. punctulans* as a probable synonym.

Pseudomonas tomato is a gram negative, rod-shaped, motile bacterium having 1-2 polar flagella (13, 105). On King's medium B, cream colored *P. tomato* colonies will produce a diffusible green fluorescent pigment. Like many leaf blighting pseudomonads, *P. tomato* lacks cytochrome C and is oxidase negative (105).

Pseudomonas tomato has been observed to cause lesions on leaves, fruits, stems, pedicels, peduncles, petioles, and sepals of tomato plants (12). Schneider and Grogan have also suggested that the organism is pathogenic on tomato roots (82).

Leaf lesions start as small water-soaked spots that develop into angular to round, dark-brown, necrotic lesions. They can be 1-3 mm in diameter and extend through the leaf. Bacterial speck lesions are often surrounded by distinct chlorotic halos. Holes frequently form in the center of dried lesions giving older leaves a ragged appearance. Severely infected leaves turn chlorotic and drop prematurely, causing plant defoliation (7, 12, 42, 102).

Small "speck-like" fruit lesions range in size from barely visible to 1 mm in diameter. The dark brown lesions may be slightly raised to the touch and possess an intense green margin. Lesions usually do not penetrate deeply into the fruit flesh. Multiple infections can create large scabby areas on the fruit (12, 102).

Like *X. vesicatoria*, *P. tomato* does not attack mature fruit. Yunis et al. (109) investigated this phenomenon in relation to pH changes in the fruit. Since Bryan (12) reported an optimum pH range of 6.6 to 7.4 for growth and multiplication of the pathogen in culture media, only the pH of green fruit skin, 6.3., would be suitable for multiplication of the pathogen. The pH of red skin, 5.2, would be below the optimum.

The reported host range for *P. tomato* includes only *L. esculentum* and *Solanum melongena* (eggplant) (70).

Current Nomenclature

Currently, both *P. tomato* and *X. vesicatoria* are regarded as nomenspecies belonging in the *P. syringae* group and the *X. campestris* group, respectively (13, 107). Each grouping contains several nomenspecies possessing similar biochemical and physiological characteristics. The pathogens

in these groupings are differentiated mainly by their host range and the type of disease symptoms they elicit. The different pathogenic capabilities are denoted by "pathovar" epithets. Thus, the causal agent of bacterial speck is identified as *P. syringae* pv. *tomato* Okabe, and the causal agent of bacterial spot is *X. campestris* pv. vesicatoria Doidge (107).

In this review, the synonyms *P. tomato* and *X. vesicatoria*, which are more commonly used in the literature, will be used to identify the pathogens.

Disease Development

Bacterial spot is considered a warm-weather disease favored by temperatures of 23-28°C (7, 66, 69). Bacterial speck epidemics have occurred under a wider range of temperatures with disease development possible in the 13-23°C range (7, 83, 89, 109). Both diseases are favored by high humidity and abundant moisture (7, 25, 31, 83, 89).

High relative humidity and free water on the plant surface are believed to play an important part in the survival of these plant pathogenic bacteria and their subsequent multiplication to serve as an inoculum source (60, 83, 84). Bacteria are not physically capable of passing through plant protective barriers, such as the cuticle or epidermis. Therefore, plant infection must take place through the many natural openings that exist (5, 38, 43, 45, 84). Leaf surface moisture may enable bacteria to reach and enter stomata or wounds.

Vakili (103) acknowledged the importance of rain and strong winds in increasing the severity of bacterial spot. These conditions are the primary agents for creating microscopic wounds, such as epidermal punctures

from wind-blown soil particles, leaf hair breakage, and water congestion of intercellular spaces, which predispose plant tissue to infection. Since young fruits lack stomata, it has been suggested that infection occurs through wounds caused by windblown particles, insect punctures, cuticular cracks, or broken epidermal hairs (12, 38).

After entering the host plant, bacteria rapidly multiply and spread intercellularly causing a disorganization of the host cell cytoplasm and disruption of cellular membranes (43, 45, 47). This results in the loss of cell electrolytes. Further dissolution of cell wall material and the middle lamella leads ultimately to cell collapse and death (6, 20, 43, 94).

Bacterial toxins have often been associated with symptom development. Cook and Stall (22) and Sasser et al. (80) have found evidence suggesting that *X. vesicatoria* produces volatile materials, *in vitro*, that cause necrosis of plant leaf cells. Work by Bashan et al. (6) revealed that *P. tomato* may produce toxic levels of ammonia when grown on media or within the host. Increased concentrations of ammonia were determined to be the necrotic factor involved in symptom development of bacterial speck.

Pathogen Survival and Dissemination

Although plant pathogenic bacteria, including *P. tomato* and *X. vesicatoria*, do not produce resting spores or other structures which protect them during long unfavorable periods, these pathogens may survive from season to season on seed, in diseased plant debris, in the soil, and on perennial plant hosts or parts. More recently, pathologists have discovered special asymptomatic relationships bacteria form with host plants. These relationships are thought to play a significant role in pathogen survival (60, 86).

Both *P. tomato* and *X. vesicatoria* possess a resident or epiphytic phase in their life cycle (5, 58, 59, 83, 84, 103). During this period, the pathogen may multiply on the surface of an apparently healthy host plant, producing no disease symptoms. Laub and Stall (58) found evidence that *X. vesicatoria* can survive intercrop periods as a resident on perennial weeds. This phase of the life cycle may significantly influence disease epidemiology by allowing small numbers of resident pathogen cells to multiply and spread, producing a large inoculum source, even under unfavorable conditions for disease development (59, 60, 86). Evidence also suggests that these pathogens may "rest" inside plant tissue or in the soil. Schneider and Grogan (84) found that low, stable populations of *P. tomato* were able to survive in intact, nonliving tomato leaf trichomes during adverse periods.

Evidence that *X. vesicatoria* may overwinter in the soil in association with plant debris has been reported by Krupka and Crossan (56) and Peterson (73). Peterson (73) observed that the bacterium was noncompetitive with other soil microorganisms. It was rapidly eliminated from the soil if not in association with plant residue. His data also suggest that the bacterium may survive in the rhizospheres of dead plants. Research by Diachun and Valleau (32) has demonstrated the ability of *X. vesicatoria* to grow on and survive a winter season in Kentucky in association with wheat roots. Bashan et al. (5) and Chambers and Merriman (14) have suggested that *P. tomato* may also survive in the soil and in association with tomato debris. Schneider and Grogan (83) found *P. tomato* to be soil-borne and nearly ubiquitous in the coastal areas of California. They were able to isolate the

bacterium from the roots and foliage of many diverse weed and crop plants found in and around fields with and without a history of tomato culture.

In the 1920s, it was reported that *X. vesicatoria* was seed-transmitted (38, 45). Gardner and Kendrick (38) reported that the bacterial spot pathogen survived for 16½ months on tomato seed. Research reports have also suggested that *P. tomato* is seed-borne (5, 14, 51). Seed may become contaminated during the seed extraction process. During this period, bacteria originating from fruit lesions come into contact with and adhere to the seed surface (5, 102). However, Schneider and Grogan (83) questioned the importance of *P. tomato* seed transmission after failing to find the pathogen in several lots of suspected seed. Chambers and Merriman (14) also questioned the role of seed as an inoculum source. Their investigation determined that both seed extraction processes, acid and fermentation, did not favor pathogen survival.

Transplants have also been credited with disseminating both pathogens (23, 42, 51, 64). Many of the transplants used in northern tomato growing areas are produced in concentrated areas of the southeastern U.S. Environmental conditions in these areas are often conducive to disease development, making the production of disease-free transplants difficult.

Man may also be a factor in disseminating the pathogen. It has been shown that fruit symptoms of bacterial spot increased when tomatoes were picked while vines were wet and decreased sharply if the vines were dry (17). Cultural practices, such as transplant clipping, and extensive transplant handling while pulling, packing, unpacking, and transplanting may also disseminate inoculum throughout the plant population (42, 64).

Both wind and rain play a major role in distributing bacterial pathogens throughout a field. Disease epidemics have often been positively correlated with stormy weather (1, 25, 43).

Disease Control - Cultural and Chemical

Disease outbreaks of both bacterial speck and spot are difficult to control. The most successful control measures are preventive and should be started early in the season as part of an integrated pest management program. Crop rotation can be valuable in reducing the inoculum potential of pathogens that survive in soil and crop debris (42, 102). Tomatoes should not be grown more than once every three years in the same field. To maximize the rotation's effectiveness, alternate hosts, such as pepper and eggplant, should not be included in the rotation. Weeds and volunteer hosts should also be eliminated from production sites (58, 86).

Soil fumigation may be recommended in beds or fields with known disease problems (102). Although expensive, fumigants reduce weed populations, soil-borne plant pathogenic bacteria, fungi, and nematodes. However, fumigation effects may vary (65). Jaworski et al. (49) reported that soil fumigation with a mixture of methyl bromide and chloropicrin was ineffective at controlling bacterial spot in peppers.

Growers are urged to buy either certified pathogen-free seed or transplants grown by reputable producers (42, 64, 102). When using seed contaminated with bacterial pathogens, hot water seed treatments may effectively reduce or eliminate the pathogen. In these treatments, seed is soaked for 25-60 minutes in 48-56^{o}C water (14, 42, 71). Although longer

treatments and higher temperatures insure pathogen-free seed, the germination percentage is usually lowered (42).

Cultural practices to reduce the incidence of disease in field-grown transplants or seed production fields include crop rotation, seed sanitation, field sanitation, avoidance of unnecessary wounding, and copper and/or streptomycin spray programs (42, 64). The most common spray recommendation for production fields has been to use one of the fixed copper materials, specifically copper hydroxide, copper oxychloride sulfate, or basic copper sulfate (16, 25, 85, 93, 109). Best results have been obtained when sprays are applied soon after emergence and repeated every 7 to 10 days and immediately after heavy rains. Copper materials have also been used in combination with dithiocarbamates (14, 16, 25, 72, 102).

Disease control has also been achieved using commercial formulations of streptomycin, an antibiotic (16, 17, 24, 85, 93). Like copper, streptomycin sprays are most effective when applied to prevent the disease and when used in conjunction with practices that discourage disease establishment and spread. Drawbacks to using streptomycin include both its high cost and its erratic control of bacterial spot (17, 26, 95, 97). Stall and Thayer (95) have concluded that variability for streptomycin resistance exists within natural populations of *X. vesicatoria*. Therefore, continued field use of streptomycin may contribute to a buildup of resistant bacteria and reduced disease control. Dahlbeck and Stall (29) conducted a study to determine the mutation rate for streptomycin resistance using isolates of *X. vesicatoria*. They measured an apparent mutation rate of 1.9×10^{-9} per cell per division.

Woltz and Jones (106) observed greater incidence and severity of bacterial spot on both pepper and tomato plants in high Mg treatments of a fertility experiment using streptomycin for disease control. Subsequent experimentation found that increased levels of Mg reduced the inhibitory effect of streptomycin on *X. vesicatoria* growth *in vitro*. These results were explained by streptomycin's mode of action, which is to compete with Mg for critical sites on bacterial ribosomes. When these sites are filled with streptomycin, certain physiological functions, such as protein synthesis, are inhibited. These results suggest that growers should avoid excessive applications of Mg and not apply spray mixtures of streptomycin and Mg (106).

Disease Control - Genetic

Several tomato lines have been evaluated for bacterial spot resistance. Plant Introduction accessions reported as resistant are listed by Clark et al. (15). In 1942, Alexander et al. (3) surveyed *Lycopersicon* introductions for resistance to several diseases which occurred in both Ohio and Indiana. The bacterial spot evaluation was made on the basis of the foliage reaction of young greenhouse seedlings. Several lines were reported to possess bacterial spot resistance, although none were completely immune. A range of P.I. lines and commercial cultivars were tested for their foliage reaction toward the bacterial spot pathogen by Coyne and Schuster (27). Most lines tested were susceptible. However, P.I. 126923 (*L. esculentum* x *L. pimpinellifolium*, Peru) possessed some resistance. Crill et al. (28) field-screened several cultivars and inbred lines to rate differences in susceptibility to the bacterial spot organism. Their

results suggest that field screening, at least under conditions favoring disease development, could be practically applied and that differences in susceptibility exist. In India, Mathew and Patel (63) screened 840 indigenous and introduced tomato lines. All lines tested were susceptible; however, a few lines showed less susceptibility than others. Volin (104) described a breeding program for bacterial spot resistance in Florida. Selected P.I. accessions having weak resistance were crossed with fresh market breeding lines. The resulting progenies were then evaluated in both greenhouse and field screenings. Volin reported that selection of lines possessing usable resistance was difficult because resistance seemed to be inherited polygenically and because the level of observed resistance was masked by other factors.

Pitblado and Kerr (75) found resistance to the bacterial speck pathogen in advanced breeding lines, Ontario 782, Ontario 7611, and Ontario 7710. An evaluation of all the parental lines involved in the various pedigrees revealed the source of resistance to be 'Farthest North', an early, tiny-fruited cultivar. It was further determined that 'Farthest North' derived its resistance from an unidentified *L. pimpinellifolium* P.I. line. An inheritance study determined that resistance was controlled by a single, dominant gene. The authors also reported that 16 other early, soft-fruited cultivars and four P.I. accessions (two *L. hirsutum* f. *glabratum* and two *L. pimpinellifolium*) were resistant to bacterial speck. After conducting field and greenhouse tests, Yunis et al. (108) reported that the fresh market cultivars 'Hosen - Eilon' and 'Rehovolt - 13' possessed field resistance to bacterial speck.

Several pepper (*Capsicum* spp.) introductions have been reported as resistant to *X. vesicatoria* (90, 91, 92). A genetic study was conducted by Cook and Stall (19) to determine the mode of inheritance of bacterial spot resistance in P.I. 163192. They concluded that resistance was conferred by a single dominant gene. Stall and Cook (94) further characterized the resistance observed in P.I. 163192 as being a hypersensitive reaction to the bacterium. When high concentrations of *X. vesicatoria* were infiltrated into resistant pepper leaves, the inoculated areas developed into large atypical necrotic lesions within 24 hours. This reaction is similar to hypersensitive reactions described by Klement et al. (55) on tobacco. Less bacterial multiplication (94) and quicker cell membrane deterioration (18, 80) have been observed in hypersensitive host tissue.

Using the resistance found in pepper lines, *X. vesicatoria* can be classified into 3 pathotypes using the following differentials (21):

Pepper strain, race 1. Isolates that elicit susceptible reactions from all tomato and pepper lines;

Pepper strain, race 2. Isolates that elicit susceptible reactions from all tomato and pepper lines not carrying the single, dominant gene for hypersensitivity from P.I. 163192;

Tomato strain. Isolates that elicit a susceptible reaction from tomato lines and a hypersensitive reaction from pepper lines.

These relationships are summarized in Table 1.

Table 1. Differentiation of *X. vesicatoria* pathotypes

Host	Pathogen		
	Pepper strain		Tomato strain
	Race 1	Race 2	
Tomato cvs. (all)	+[a]	+	+
Pepper cvs. (Early Calwonder)	+	+	-
Pepper (PI 163192)	+	-	-

[a] + = compatibility (susceptibility); - = incompatibility (hypersensitivity).

Dahlbeck and Stall (29) suggest that most pepper lines contain a single gene for resistance to the tomato strain of *X. vesicatoria*. P.I. 163192 and derived lines possess an additional gene-for-resistance. Assuming a gene-for-gene mechanism is present, pepper strain, race 2 would need one and pepper strain, race 1 would need two corresponding genes, respectively, to overcome the pepper genes for resistance. Using fluctuation analysis, Dahlbeck and Stall measured race change mutation rates. Conversions from tomato strain to pepper strain, race 2 and from pepper strain, race 2 to pepper strain, race 1 occurred at an apparent frequency of 4×10^{-4} per cell per division. Direct conversion of the tomato strain to pepper strain, race 1 was not observed. These results were expected, since direct conversion would require a double mutation by the pathogen which would occur at an extremely low frequency.

Field experiments conducted by Dahlbeck et al. (30) studied the effect of vertical and horizontal resistance on the development of a bacterial spot epidemic. They used the following pepper lines: 1) lines without any

known resistance to the pepper strains of *X. vesicatoria*, 2) lines with vertical resistance derived from P.I. 163192, 3) Early Calwonder, believed to have horizontal resistance, and 4) a line combining both vertical and horizontal resistance. The results indicate that vertical resistance delayed disease onset, while horizontal resistance reduced infection rates. Lowest disease levels were found in the line possessing combined resistance. Both types of resistance resulted in increased yield.

Inoculation Procedures

Basu (7) investigated bacterial spot symptom development on spray inoculated, 3-week-old tomato plants. Distinct symptoms developed when the inoculum contained at least 1×10^3 bacterial cells/ml and the plants were incubated between 23-28°C with a relative humidity of 87-97%. This agrees with work by Nayudu and Walker (69), who reported that continuous incubation at 24°C favored increased disease development. Davis and Halmos (31) obtained the most severe infections when tomato plants were subjected to high humidity both before and after inoculation. Volin (104) sprayed first true leaf seedlings with inoculum diluted to approximately 1×10^6 bacterial cells/ml. After inoculation, plants were placed under intermittent mist for 48 hours. Infected greenhouse seedlings were assigned a disease index by dividing the average number of infection sites on terminal leaflets by the average number of infection sites on the terminal leaflet of the susceptible check and multiplying by 100. Mature field plants were rated using a 0-9 scale: 0 = escape or immune, 9 = spots and necrosis coalescing and covering much of the leaf.

Coyne and Schuster (27) used a dissecting needle dipped in a bacterial suspension to puncture young, fully-expanded tomato leaves. The plants were then sprayed with water and covered with plastic for 24 hours. The amount of necrosis and yellowing around the puncture were rated.

Gardner and Kendrick (38) obtained bacterial spot lesions on fruits less than 2.5 cm in diameter by atomizing them with inoculum at an early age.

Basu (7) reported the numerical threshold of infection for *P. tomato* to be 1×10^6 bacterial cells/ml. Typical disease symptoms developed on spray inoculated plants when the relative humidity was held between 87-97% and the temperature ranged between 15-28°C. Infection studies by Bashan et al. (5) found that an inoculum concentration of 1×10^4-10^5 bacterial cells/ml was sufficient to induce typical bacterial speck symptoms on spray inoculated tomato plants. Pretreatments of wounding or high humidity and temperature to open up stomates increased lesion number and severity. Pitblado and Kerr (75) grew tomato plants in flats or plastic pots to a height of 10-20 cm. Plants were then spray inoculated with a suspension of *P. tomato* and placed in a 25°C mist chamber. Visual readings of lesion development were taken 10 days after inoculation using a scale of 0-3: 0 = no disease, 3 = greater than 10 lesions/leaf.

Bryan (12) reported inoculating fruits by swabbing them lightly with a cotton wad dipped in inoculum or thrashing the fruit with leaves before spraying with inoculum. Leaves and stems were inoculated using similar procedures. Infection of young seedlings was also obtained by either inoculating the seeds or the soil prior to planting.

Emmatty et al. (36) described an inoculation technique where the cotyledons of 10-day-old seedlings were dipped in inoculum containing 7 x 10^8 bacterial cells/ml before transplanting. Plants were then placed in a growth chamber and held at 17.6°C, or in the greenhouse and held at 18.8°C. Susceptible plants in both incubation treatments died within two weeks from a severe infection of both the cotyledons and terminal buds.

MATERIALS AND METHODS

Plant Material and Growing Conditions

In 1980, 4,408 accessions of *Lycopersicon* spp. were received from the North Central Regional Plant Introduction Station, Ames, Iowa. These lines represented the entire P.I. collection of *Lycopersicon* spp. available for distribution. Included in the collection were various genetic stocks, members of *L. glandulosum*, *L. hirsutum*, including form *glabratum*, *L. peruvianum*, including var. *dentatum* and *humifusum*, *L. cheesmanni* f. *minor*, *L. pimpinellifolium*, *L. esculentum*, including form *pyriforme* and var. *cerasiforme*, and various known or suspected species crosses (87).

Wooden flats 14" x 20" x 3" were filled with a pasturized greenhouse soil mix consisting of equal parts of loam, peat, and perlite. A planting pegboard was used to space 10 rows of 4 hills each per flat. Two to three seed of each accession were sown per hill, 4 hills per accession. After 14 days, seedlings were thinned to 1 plant per hill.

An initial survey of several different tomato cultivars showed that the *L. esculentum* cultivar Chico III was highly susceptible to both bacterial speck and bacterial spot pathogens. Because of its susceptibility, 4 hills of Chico III were planted in each flat as a susceptible check. After a number of screenings, PI 114490 (*L. esculentum*) was found to possess an intermediate level of resistance to bacterial spot. In addition, Ontario 7710 (*L. esculentum*) was shown to possess bacterial speck resistance. Each of these cultivars were included as resistant checks in their respective pathogen screenings. Greenhouse-grown seedlings were produced

under natural light. They were fertilized weekly through a trickle tube irrigation system using a commercial 20-30-20 fertilizer at the rate of 1 part per 12 parts water. Seedlings were placed inside the inoculation chamber at the 2 to 3 true leaf stage.

The inoculation chamber was a portion of a greenhouse bench fitted with a wooden frame measuring 3'5" x 4'5" x 25' long and covered with Monsanto 602 greenhouse film. It held 24 flats which allowed 240 lines to be screened per test. Normally, a group of 24 flats were planted every other week for maximum use of the inoculation chamber. Temperatures inside the chamber were warmer than ambient greenhouse temperatures. During the summer months, temperatures averaged 25±2°C. Temperatures during the winter months averaged 22±2°C. Misters inside the chamber provided a relative humidity of 95-98%.

Pathogen Organisms and Culture

Local isolates of *X. vesicatoria* (designated XV-IA), from infected tomato fruit, and *P. tomato* (designated PT-IA), from infected tomato foliage, were used for the bacterial spot and bacterial speck screenings, respectively. Other pathogenic isolates were used as comparisons in determination and inoculation tests. Isolates of *X. vesicatoria* included: ATCC 11551; XV-FL, isolated from infected tomato foliage collected at Bradenton, Florida; and XV-GA, isolated from an infected tomato transplant originating from Tipton, GA. An additional *P. tomato* isolate was supplied by Dr. D. A. Emmatty, Agricultural Research Department, Heinz, U.S.A., Bowling Green, Ohio (PT-OH).

Isolation of bacteria from plant tissue was achieved by surface sterilizing infected host tissue with alcohol and then placing the tissue in 20 ml of sterile distilled water. A sterile glass rod was then used to crush the host tissue. After a few minutes, the contaminated water was streaked onto a petri plate containing Difco nutrient agar. After incubation at 25°C, *X. vesicatoria* produced round, dome-shaped, glistening yellow colonies. These colonies were gram negative, gave weak to negative cytochrome oxidase reactions, and produced no fluorescent pigment on King's B media. *Pseudomonas tomato* produced translucent to white colored colonies that were round to irregular in shape and slightly flattened. On King's B media, the colonies were round, domed, creamy white in color, and produced a green fluorescent pigment visible under ultraviolet light. Gram stain and cytochrome oxidase reactions were negative.

Pathogenic relationships of the collected isolates with selected genotypes of *Lycopersicon esculentum* (tomato), *Capsicum annuum* (pepper), and *Solanum melongena* (eggplant) are presented in Table 2. Inoculations were made by atomizing bacterial suspensions over the top and bottom of plant leaf surfaces. Plants were then incubated under mist for 3 or 4 days. Pathogenicity was also tested by the injection infiltration method described by Klement (53). Inoculum containing 1×10^8 CFU/ml was infiltrated into a mature leaf's intercellular spaces using a 30 gauge hypodermic needle. Plants were then incubated in the greenhouse and symptoms observed. The infiltrated areas of both hypersensitive (resistant) and susceptible plants were characterized by the sequential development of a watersoaked zone followed by cellular collapse and tissue desiccation.

Table 2. Pathogenic relationships of collected isolates

Pathogen	Tomato	Pepper		Eggplant	Pathotype
	'Chico III'	ECW[a]	163192	'Blackbell'	
ATCC 11551	+[b]	-HR[c]	-HR	-	Tomato
XV-FL	+	-HR	-HR	-	Tomato
XV-IA	+	+	-HR	+	Pepper, race 2
XV-GA	+	+	+	+	Pepper, race 1
PT-IA	+	-HR	-HR	+	
PT-OH	+	-HR	-HR	+	

[a]'Early Calwonder'.

[b](+) foliage symptoms, (-) no symptoms from spray inoculation.

[c](HR) hypersensitive reaction to infiltration inoculation.

Hypersensitive reactions became evident 18 to 24 hours after inoculation, while susceptible reactions took 36 to 48 hours to develop.

Using the classification scheme of Cook and Stall (21), Table 2 shows ATCC 11551 and XV-FL to be "tomato" strains of the pathogen. A hypersensitive reaction (HR) was induced when these isolates were infiltrated into pepper leaves. Since XV-GA was compatible with all genotypes while XV-IA caused a HR in the leaves of PI 163192, XV-GA and XV-IA were designated "pepper" strain, race 1 and race 2, respectively. Table 2 also indicates differences in pathogenic abilities between isolates of *X. vesicatoria* with eggplant. Only XV-IA and XV-GA produced necrotic lesions on the foliage after spray inoculation.

The *P. tomato* isolates were pathogenic on plants of Chico III tomato and Blackbell eggplant. When inoculum was infiltrated into pepper leaves, a HR developed within 24 hours. These observations agree with Okabe (70), who listed *L. esculentum* and *S. melongena* as hosts for *P. tomato*. However, other sources, including Bryan (12), have listed only *L. esculentum* as a host.

Xanthomonas vesicatoria was found to lose virulence when maintained on Difco nutrient agar for more than a few weeks. For this reason, the pathogen was "stored" in Chico III host plants and reisolated whenever needed. This procedure was also used to "store" *P. tomato*, although no loss of virulence on this media was observed.

To increase inoculum for disease screening, the respective pathogen was reisolated from the infected Chico III storage plant using the procedure previously described. Typical looking colonies were then selected from streak plates and uniformly spread over 3 or 4 petri plates

containing Difco nutrient agar. Plates were incubated at 25°C for 24 to 48 hours to promote growth. After incubation, petri plates were covered with either a cream (*P. tomato*) or yellow (*X. vesicatoria*) colored viscous mass. To produce an inoculum suspension, each plate was flooded with 5 to 10 ml of sterile distilled water. A rubber policeman was used to scrape the bacterial mass off the agar surface and into a sterile flask. Seventy-five ml of sterile water were added and the flask shaken to create a thick cloudy suspension. The inoculum suspension was then filtered through Whatman No. 1 filter paper to remove large particles. Using a Bausch and Lomb Spectronic 20 set at 540 nm, the filtered inoculum was adjusted with sterile distilled water to obtain an absorbance reading of 0.1 for *X. vesicatoria* suspensions and 0.13 for *P. tomato* suspensions. Dilution plate counts determined suspensions with these optical densities contained approximately 1×10^8 colony forming units (CFU)/ml. This inoculum concentration was found to produce typical symptoms of bacterial spot and bacterial speck of tomato. More dilute inoculum produced only scattered leafspots and more concentrated inoculum caused such abundant infections that the leaf would rapidly turn necrotic and fall off. Either result made it harder to differentiate between resistant and susceptible genotypes.

Inoculations

The preincubation of well-watered plants under mist, which created relative humidities of 95-98%, for 24 hours prior to inoculation was found to be essential for promoting plant infection by either pathogen. Bashan et al. (5) and Davis and Halmos (31) have also reported the importance of this predisposition period for influencing infection rates.

Although the greenhouse environment and the inoculation procedure used caused a minimum of plant wounding, conditions during the incubation period were believed to promote stomatal opening, which created a port of entry for the pathogen. Because bacteria enter the plant only through natural openings or wounds (43), an increased number of stomatal openings is necessary to induce high infection rates.

Post inoculation incubation under mist for 24 to 48 hours was also necessary for optimum infection and symptom development. The moist plant surfaces in the chamber favored bacterial multiplication and infection (60). Plants removed from the chamber at inoculation and incubated on a greenhouse bench produced fewer symptoms of lesser severity.

Temperatures above 23°C were optimum for bacterial spot screenings. The amount and severity of symptoms were reduced if temperatures fell below 23°C. Conversely, bacterial speck symptoms were more reliably produced when temperatures were below 25°C. Because of this, the bacterial speck screenings were done during the cooler winter months.

Inoculation of plants was accomplished using a DeVillibiss atomizer connected to a compressed air line equipped with a pressure regulator set at 85 psi. During inoculation, the atomizer was held 4 to 6 inches above the plant canopy and carefully moved up and down the rows to provide complete and uniform plant coverage. This technique minimized excess runoff and resulted in all of the foliage being finely wetted. The atomizer reservoir held 42 ml of inoculum, which was sufficient to inoculate 2 flats or 80 plants. On the average, each plant received 0.525 ml of inoculum containing 5.25×10^7 CFU.

Small, circular, water-soaked lesions appeared on the underside of Chico III leaves 4 to 6 days after spray inoculation with *X. vesicatoria*. These lesions soon became necrotic, having a final diameter of 1-4 mm. The necrotic area was visible on both sides of the leaf and greenish-yellow to brown in color. Chlorotic halos were often present around the necrotic tissue, but could be absent. Dark brown lesions were also observed on the leaf petioles and plant stems.

Foliage symptoms of bacterial speck of tomato started as small water-soaked spots first visible on the underside of the leaf. Within 5 to 7 days after inoculation, the lesions became necrotic, dark brown to black in color and surrounded by a chlorotic halo. The necrosis extended through the leaf and ranged in size from minute specks to 3 mm in diameter. The amount of chlorosis was variable, but chlorotic tissue often formed a band 1-2 mm wide around the necrotic tissue. Lesions also formed on the leaf petioles, stems, and flower parts.

Data on the incidence and severity of disease symptoms were taken 10-14 days after spray inoculation when symptoms were fully expressed. The top 2 fully-expanded and uniformly-infected leaves of each plant were evaluated using the rating scale presented in Table 3. If 1 leaf was more severely infected than the other, it was used to make the rating. Standard area diagrams (48) showing representations of infected leaf areas were used to define the limits of each rating class. Both pathogens produced leaf tissue chlorosis around the infection site. However, since this symptom was quite variable, even within genotypes, it was not considered as part of the infected leaf area when rating the disease response. After a little practice, each plant's disease response was quickly and

Table 3. Classification of disease response

Rating	Generalized description of disease response
0	No disease symptoms
1	1-3% of leaf area having necrotic lesions
2	3-6% of leaf area having necrotic lesions
3	6-12% of leaf area having necrotic lesions
4	>12% of leaf area having necrotic lesions

easily classified into one of the 5 classes. Subjectively, ratings of "0" or "1" were considered indicative of resistance, "2" ratings intermediate susceptibility, and "3" or "4" ratings susceptibility. Lines receiving mean ratings less than "2" were normally retested. This was done to identify susceptible genotypes that might have escaped infection. Unfavorable environmental conditions, such as a water stress or evaporative air drafts, were the most common cause of escapes.

The youngest leaves on a plant were observed to be the most susceptible to infection. Davis and Halmos (31) and Nayudu and Walker (69) also reported increasing susceptibility to infection with decreasing leaf age when inoculating with *X. vesicatoria*.

Occasionally, the youngest leaf on a plant, just emerging and expanding at the time of inoculation, would develop large, irregularly-shaped, necrotic lesions. This necrosis sometimes caused the leaf to be puckered and deformed at maturity. During bacterial speck screenings, this symptom sometimes occurred on plants considered resistant to the pathogen. Only

the young, expanding leaf at the time of inoculation was infected, the rest of the leaves would be symptomless. Investigation found that this symptom did not develop if a plant's exposure to mist was limited to less than 72 hours. This procedure did not hinder the development of typical leafspot-type symptoms on susceptible plants.

Diallel Crossing of Bacterial Speck Resistant and Susceptible Lines

To determine whether resistance to *P. tomato* in PI 112215 (*L. pimpinellifolium*), PI 129157 (*L. hirsutum* f. *glabratum*), and Ontario 7710 (*L. esculentum*) is based on the same or different genes, a diallel crossing scheme, which included the susceptible cultivar Chico III, was initiated.

Parental plants were grown in 2-gallon plastic pots in the greenhouse. Crosses were made during the spring of 1981. Flowers used as females were emasculated with sharp pointed forceps when the flowers began to show petal color. Ripe anthers were removed from freshly opened flowers of the selected male parent and their pollen was scattered over a thumbnail. The pollen was then placed in contact with the exposed stigma of the emasculated flower. The resulting hand-pollinated flower was tagged and all extra buds, flowers, and fruits were removed from the truss. At maturity, tagged fruits were harvested and the seeds removed. Seeds were cleaned for 2 hours in a 10% HCl acid bath, water rinsed and air-dried.

All attempts to use PI 129157 as a female parent in the diallel were unsuccessful. Unilateral incompatibility between *L. esculentum* and *L. hirsutum* f. *glabratum* has also been reported by MacArthur and Chiasson (62) and Rick (77).

Two plants of each F_1 population were grown in the greenhouse during the summer of 1981. Self-pollinated fruits were harvested for F_2 seed extraction. A representative sample of 10 fruits were collected from each parent and F_1 plant to determine fruit shape, weight, diameter, length, locule number, flesh color, and fruit epidermis color.

Parent, F_1, and F_2 seedlings from the diallel were tested for foliar resistance to bacterial speck using the spray inoculation procedure previously described. Parent and F_1 plants were also tested for hypersensitivity to *P. tomato*.

Data Presentation

Appendix A contains a final summary of the data collected from both the bacterial spot and bacterial speck disease screenings. It reports the species classification, the source or origin of the accession, and the disease evaluation data for each line.

After all disease ratings were recorded, a mean disease rating was obtained along with its standard deviation and a standardized disease index (DI). DIs were obtained by dividing the mean disease rating of each PI line grown in a flat by the mean disease rating of Chico III grown in the same flat. The quotient was multiplied by 100 to obtain a whole number. When the line was tested in more than one flat, the DI in Appendix A is a weighted mean. This standardization allows comparisons to be made between lines not tested in the same flat or test. Although efforts were made to keep conditions as uniform as possible from test to test, differences in disease expression, as measured on Chico III, did occasionally occur. The DI, which expresses the mean disease rating of each line as a

percentage of Chico III, reduces some of this bias when making comparisons and rankings.

RESULTS AND DISCUSSION

Bacterial Spot Screenings

Approximately 4,408 named varieties and PI accessions were screened for resistance to bacterial spot. Three thousand eight hundred ten or 86% of these belong to the species *L. esculentum*. The remaining 14% are members of various wild *Lycopersicon* species, genetic stocks and species crosses maintained by the PI station.

A summary of the bacterial spot and bacterial speck evaluations is contained in Appendix A. Appendix A presents the identity of each line and the number of plants tested. In addition, a mean disease rating, a standard deviation, and a disease index (DI) are given. If the line was included in more than one test, the DI presented is a weighted mean. It is important to remember that the DI is a relative score, derived by dividing the disease rating of a particular line in a flat by the disease rating of susceptible Chico III in the same flat.

The lowest bacterial spot DI was 33. No line was identified that consistently expressed a symptomless reaction to inoculation under conditions conducive to infection. This was unexpected, since genes conditioning hypersensitivity to the pathogen have been found within the *Capsicum* species (18). If the hypersensitive genotype exists in the *Lycopersicon* sp., it is possible that it was overlooked. Such a genotype could be hidden in a heterogeneous line, or in plants that developed the atypical symptoms previously discussed. However, the data do not suggest that strong resistance or hypersensitivity to bacterial spot is widespread within the *Lycopersicon* sp. Analysis of the data for all tested lines revealed a mean

DI of 93. Summaries of the data by species or by source (country) revealed little difference in susceptibility among the groupings (Appendices B and C). Accessions originating from England received the lowest mean DI of 62. Individual DI scores ranged from 33 to 400 suggesting that differences in susceptibility to the pathogen exist among genotypes. PI 114490, *L. esculentum*, was used as a resistant check in many tests and illustrates a problem that occurs when identifying and measuring weak sources of resistance. Seed of this accession was thought to be genetically homogeneous, since it was collected from a single plant. However, individual DI scores ranged from 0 to 143, while the line produced a mean DI of 61 based on 1,423 plant evaluations. This variability in disease expression seemed to be due to small environmental differences during inoculation and incubation. Disease ratings differed more from test to test than within a test. For this reason, it is felt that rigid standardization and control of defined inoculation methods would be needed to consistently identify and quantitate this type of resistance. Ultimately, field evaluations made under natural epidemics would be required to determine whether the level of resistance is high enough to be of commercial value.

A careful review of the literature found that reported bacterial spot resistance in *Lycopersicon* was quantitative in nature. When observations from this previous work were compared with our results, some differences were noted. These differences might be due to the difficulty in measuring resistance that is sensitive to environmental changes. Coyne and Schuster (27) reported that the foliage of PI 126923 (*L. esculentum* x *L. pimpinellifolium*) was tolerant (resistant) to the pathogen. In our tests, it received a susceptibility rating similar to Chico III. Crill et al. (28)

measured differences in susceptibility to bacterial spot among several varieties and inbred lines. In his tests, 'Campbell 28' was found to be one of the least susceptible. In our tests, Campbell 28 received a DI of 55, which compares favorably with the mean DI of 93. Four resistant accessions, PI 129061, PI 140403, PI 270243, and PI 272664, were selected for use in a breeding program in Florida (104). However, these accessions did not express strong resistance in our evaluations and received DI scores of 89, 86, 83, and 96, respectively. Three breeding lines, Heinz 420, Heinz 830, and Heinz 2990, selected for their field resistance to bacterial spot, were obtained from Dr. D. A. Emmatty, Agricultural Research Department, Heinz, U.S.A., Bowling Green, Ohio. Of the 3, Heinz 2990 received the lowest DI of 76.

The results of this screening were disappointing, since no hypersensitive lines were identified. However, the rapid ability of the pathogen to adapt through mutation might enable it to overcome this type of resistance (21, 29). The findings do indicate that differences in susceptibility exist and identify several lines worth further evaluation. Twenty-five lines received DI scores of 50 or less, while 565 received DIs of 75 or less. Resistance of this type is often controlled polygenically and considered more stable than monogenic resistance (41). Utilizing these types of lines in breeding programs is feasible only if methods of measuring disease resistance produce consistent results. This may require precise control of inoculation methods and environmental conditions. Methods such as infectivity titrations (37) and the use of growth chambers may be of value. Refined techniques could make it possible to transfer, and possibly intensify, bacterial spot resistance into adapted commercial cultivars.

Bacterial Speck Screenings

The bacterial speck screenings were initiated in the fall of 1981, after finding resistance in 2 wild *Lycopersicon*, PI 112215 and PI 129157. These findings, along with the knowledge that Ontario 7710 derived its resistance from a *L. pimpinellifolium* line, suggested that bacterial speck resistance might exist in other wild *Lycopersicon*. Using the methods and facilities previously described, 540 PI accessions and named varieties were tested for bacterial speck resistance. The results are presented in Appendix A. While this work was in progress Pitblado and Kerr (75) and Pilowsky and Zutra (74) have also reported finding bacterial speck resistance in various wild *Lycopersicon* lines.

Bacterial speck resistance was prevalent among the tested lines. One hundred forty, or 26%, of the lines received a DI of 10 or less, while 237, or 44%, received a DI of 50 or less. Many of these lines exhibited symptomless reactions, similar to Ontario 7710, when inoculated with *P. tomato*. Numerous accessions were heterogeneous in their response to inoculation. Since single plant ratings are not presented in Appendix A, heterozygous accessions can often be identified by their large standard deviations (greater than 0.5).

Time limitations and the large number of resistant ratings prevented the retesting of all resistant or questionably resistant lines. Thus, scores for individual lines may differ upon retesting. However, the findings do indicate that symptomless reaction to inoculation, a type of resistance similar to that expressed by Ontario 7710, is widespread among the wild *Lycopersicon*. In addition, the range of DI scores, 0 to 150, indicates that levels of susceptibility to the pathogen also exist. Many lines

expressed susceptible reactions but received disease ratings much lower than Chico III. These plants would sometimes produce lesions having very small necrotic areas that were surrounded by a large chlorotic halo. Campbell 28 (DI of 60) and Ohio 736 (DI of 42) were 2 such cultivars. Again, DI scores for these lines seemed quite variable from test to test, suggesting that this type of resistance was environmentally influenced. Recently, Gitaitis et al. (40) reported that Campbell 28 and Ohio 7663 possess a level of field resistance to bacterial speck in tomato transplant fields. It is interesting to note that both Ohio 736 and Ohio 7663 have Campbell 28 in their parentage (8, 9).

Ninety-nine *L. esculentum* accessions and cultivars were screened for bacterial speck resistance. Nine of them received DI scores of 25 or less. The following lines showed symptomless reactions to inoculation: Niagara VF 315, Ontario 7710, Sweet 100, PI 303726 ('Earlinorth'), PI 358815, PI 358816, PI 358817, PI 358818, PI 370080 ('Subartic Delight'), PI 370088 ('Farthest North'), and PI 451973 ('Subartic Cherry'). The accessions PI 358816, PI 358817, PI 358818, and PI 370080 (Subartic Delight) contained both resistant and susceptible plants. Earlinorth is entered in the *Lycopersicon* collection as PI 201773 and PI 303726. These 2 accessions differed in their reaction to inoculation, PI 201773 being susceptible, while PI 303726 was resistant. PI 358815, PI 358816, PI 358817, and PI 358818 have also been reported as resistant to bacterial wilt (*Pseudomonas solanacearum*) (15).

Nine *L. glandulosum* accessions, all from Peru, were evaluated. Four of the lines, PI 126440, PI 126443, PI 126444, and PI 129144, received DI

scores under 25. PI 126448, PI 129144, and PI 199380 were heterogeneous for symptomless reaction to *P. tomato*.

Thirteen *L. hirsutum* and 8 *L. hirsutum* f. *glabratum* accessions were tested and only one, PI 390517, expressed a susceptible reaction. All of these lines are from Ecuador or Peru and were, for the most part, free of symptoms after inoculation.

There were 33 *L. peruvianum* accessions evaluated. Most of these were collected in Peru. DI scores ranged from 0 to 104, indicating large differences in susceptibility. Seventeen of the accessions received DI scores under 25. Most of these lines and others possibly heterogeneous for resistance contained plants visually free of symptoms after inoculation.

All 3 of the evaluated *L. cheesmanii* accessions received ratings similar to susceptible Chico III.

Two hundred ten *L. pimpinellifolium* accessions, largely from Peru, were screened for bacterial speck resistance. DI scores ranged from 0 to 150. Many of these accessions, such as PI 112215, expressed symptomless reactions to inoculation. The prevalence of resistance within the species is indicated by 117 of the *L. pimpinellifolium* accessions receiving a DI of 25 or less.

Known or suspected species crosses were also evaluated. PI 269139, PI 269140 (*L. esculentum* x *L. hirsutum*), PI 298934, PI 306813, and PI 306814 (*L. esculentum* x *L. peruvianum*) all contained plants free of symptoms after inoculation. Of the 155 *L. esculentum* x *L. pimpinellifolium* accessions evaluated, only 11 received DI scores of 25 or less.

The findings of this evaluation are in agreement with Pitblado and Kerr (75) and Pilowsky and Zutro (74), with 3 exceptions. 'Droplet',

'Oregon Cherry', and PI 370093 (*L. pimpinellifolium*) were reported resistant by Pitblado and Kerr, but were susceptible in this evaluation. The reason for this is unknown. It may be possible that the lines are heterogeneous for resistance. Or, there may be pathogenic differences in the isolates of *P. tomato* used. This would imply that different host genes are involved. However, if Droplet and Oregon Cherry carry resistance to bacterial speck, the most likely source of resistance within their pedigrees would be Farthest North (46, 4). Farthest North, which was uniformly resistant in both evaluations, is also believed to be the source of resistance in Ontario 7710.

Diallel Crossing of Bacterial Speck Resistant and Susceptible Lines

The bacterial speck resistance observed in Ontario 7710 (*L. esculentum*) and other lines with Farthest North in their parentage is believed to have originated from an unidentified *L. pimpinellifolium* line (75). Resistance from this source is conditioned by a single dominant gene. During some bacterial speck exploratory inoculations, 2 accessions, PI 112215 (*L. pimpinellifolium*) and PI 129157 (*L. hirsutum* f. *glabratum*), were found to be resistant. Both of these lines produced symptomless reactions similar to that of Ontario 7710. If these sources of resistance were based on different genes from those in Ontario 7710, they could be of potential value in controlling bacterial speck. To determine if resistance in these lines was based on different loci, a diallel was constructed using PI 112215, PI 129157, Ontario 7710, and susceptible Chico III. Parent, F_1, and F_2 populations were then evaluated for bacterial speck resistance.

Diallel crosses were made during the spring of 1981. Chico III, Ontario 7710, and PI 112215 intercrossed readily, but PI 129157 exhibited unilateral incompatibility with the other 3. These crosses were only successful when PI 129157 was used as the pollen parent. Most hybrids were genetically marked by phenotypes (leaflet size and shape) intermediate to both parents. Other characters, such as indeterminate plant growth (*Sp*) and round fruit shape (*o*) were expressed in a completely dominant manner. Data on parent and F_1 fruit characteristics are presented in Table 4.

Mature fruit on hybrid plants with PI 129157 in the parentage showed a dramatic blending of color traits. PI 129157 fruit possess green flesh covered with a colorless epidermis and dark green midlocular stripes radiating from the blossom to stem end. Hybrids with Chico III, Ontario 7710, or PI 112215 (red flesh and yellow epidermis) produced mature fruit with a light yellow-green flesh covered with a pale yellow epidermis. A muted stripe was also present in the hybrids.

Hybrids between big-fruited, Chico III or Ontario 7710, and small-fruited, PI 112215 or PI 129157, produced fruits smaller than the expected midparent mean. On the other hand, PI 112215 x PI 129157 hybrids produced fruit larger than either parent.

Because of genetic incompatibilities or poor self-pollination, hybrids between Chico III or Ontario 7710 and PI 129157 (*L. hirsutum* f. *glabratum*) produced fruits that contained approximately 10-25% undeveloped seed. These F_1 plants also showed signs of a semilethal factor, similar, but not identical to that described by Sawant (81) on *L. esculentum* x *L. hirsutum* f. *glabratum* hybrids. Sawant observed symptoms that started at branch extremities. Leaves turned pale, drooped and eventually dried up as if

Table 4. Mature fruit characteristics of selected parent and F_1 tomato populations

Population	Plant[a] growth	Fruit shape	Flesh color	Epidermis color	Fruit measurements[b]			
					Weight	Diameter	Length	Locule #
Chico III (P_1)	sp	pear	red	yellow	59.2	5.0	6.7	2.3
Ontario 7710 (P_2)	sp	sq round	red	yellow	50.6	4.6	4.8	2.4
PI 112215 (P_3)	Sp	round	red	yellow	1.9	1.6	1.5	2.0
PI 129157 (P_4)	Sp	round	green[c]	colorless	1.6	1.7	1.5	2.0
(P_1 x P_2)	sp	Sq round	red	yellow	55.1	5.1	5.1	2.7
(P_1 x P_3)	Sp	round	red	yellow	13.6	2.9	2.8	2.1
(P_1 x P_4)	Sp	round	lt. grn[c]	lt. yel.	4.7	2.2	2.2	2.1
(P_2 x P_1)	sp	Sq round	red	yellow	51.9	5.0	5.0	2.4
(P_2 x P_3)	Sp	round	red	yellow	12.4	2.5	2.9	2.2
(P_2 x P_4)	Sp	round	lt. grn.[c]	lt. yel.	4.5	2.2	2.1	2.0
(P_3 x P_1)	Sp	round	red	yellow	13.4	2.9	3.1	2.0
(P_3 x P_2)	Sp	round	red	yellow	12.6	2.9	2.7	2.0
(P_3 x P_4)	Sp	round	lt. grn.[c]	lt. yel.	2.5	1.8	1.6	2.0

[a]Sp = indeterminate; sp = indeterminate.

[b]Mean of 10 fruits, weight in grams, diameter and length in centimeters.

[c]Fruits exhibited green stripes radiating from blossom end toward stem end.

suffering from a drought stress. These symptoms then progressed down the branch and toward the base of the plant. New shoots arising from the base of the plant allowed the plant to continue vegetative growth.

In this study, Chico III x PI 129157 and Ontario 7710 x PI 129157 hybrids produced symptoms on the lowermost leaves about 4 to 6 weeks after plant emergence. The terminal leaflets folded downwards while leaf tips became chlorotic to necrotic. These symptoms enlarged until the whole leaf dried up and fell off the plant. Defoliation proceeded up the stem, reducing the vigor of the plant. Both flowering and fruit set were usually able to occur before the bearing shoot died. New shoots arising from the base of the plant kept it alive, but were also afflicted with the defoliation symptoms. Of the 2 hybrids, Chico III x PI 129157 were less vigorous and exhibited greater defoliation. Some of the progeny from these hybrids also produced weak growth and defoliation symptoms.

In contrast, hybrids between PI 112215 and PI 129157 (*L. pimpinellifolium* x *L. hirsutum* f. *glabratum*) did not show any visible signs of genetic incompatibility. Both the hybrids and their progeny produced healthy plants and normal seed production.

Parent, F_1, and F_2 progeny were evaluated for their foliage reaction to spray inoculation with *P. tomato* in the mist chamber. The results are presented in Table 5.

Chico III exhibited numerous scattered leafspots typical of bacterial speck infection. Ontario 7710, PI 112215, PI 129157, and all F_1 plants remained free of these symptoms. A few plants developed necrotic areas on the youngest expanding leaf at the time of inoculation. These "atypical" symptoms account for the "1" ratings that caused segregation ratios to

Table 5. Evaluation of parent, F_1, and F_2 diallel progenies for bacterial speck resistance

Population	No. of plants	Percent of plants by disease rating				Observed R:S	Expected R:S	Model	χ^2	P
		0	1	2	3					
Chico III (P_1)	143	0	1	17	82	0:143	0:143	0:1		
Ontario 7710 (P_2)	56	100				56:0	56:0	1:0		
PI 112215 (P_3)	47	96	4			45:2	47:0	1:0		
PI 129157 (P_4)	32	94	6			30:2	32:0	1:0		
(P_1 x P_2)	6	100				6:0	6:0	1:0		
(P_2 x P_1)	8	100				8:0	8:0	1:0		
(P_1 x P_3)	4	100				4:0	4:0	1:0		
(P_3 x P_1)	8	88	12			7:1	8:0	1:0		
(P_1 x P_4)	2	100				2:0	2:0	1:0		
(P_2 x P_3)	8	100				8:0	8:0	1:0		
(P_3 x P_2)	8	88	12			7:1	8:0	1:0		
(P_2 x P_4)	8	100				8:0	8:0	1:0		
(P_3 x P_4)	2	100				2:0	2:0	1:0		

Table 5. *Continued*

Population	No. of plants	Percent of plants by disease rating				Observed R:S	Expected R:S	Model	χ^2	P
		0	1	2	3					
$(P_1 \times P_2)\ F_2$	93	77	1	9	13	72:21	69.75:23.25	3:1	0.290	0.6
$(P_2 \times P_1)\ F_2$	98	73		9	18	71:27	73.50:24.50	3:1	0.340	0.6
$(P_1 \times P_3)\ F_2$	95	74	6	11	9	70:25	71.25:23.75	3:1	0.088	0.8
$(P_3 \times P_1)\ F_2$	98	77		3	20	75:23	73.50:24.50	3:1	0.122	0.7
$(P_1 \times P_4)\ F_2$	173	78	5	9	8	136:37	129.75:43.25	3:1	1.204	0.3
$(P_2 \times P_3)\ F_2$	98	97	3			95:3	98:0	1:0		
$(P_3 \times P_2)\ F_2$	97	100				97:0	97:0	1:0		
$(P_2 \times P_4)\ F_2$	138	98	2			135:3	138:0	1:0		
$(P_3 \times P_4)\ F_2$	96	100				96:0	96:0	1:0		

deviate from the ratios expected. In this genetic study, plants were considered resistant only if they were completely free of symptoms (0 ratings).

F_2 populations of resistant x susceptible crosses, Ontario 7710 x Chico III, PI 112215 x Chico III, Chico III x PI 129157, and reciprocals, produced good fit to a 3:1 resistant:susceptible segregation ratio.

These population distributions indicate that bacterial speck resistance in Ontario 7710, PI 112215, and PI 129157 is controlled by a single, dominant gene. Furthermore, the lack of susceptible segregates in resistant x resistant crosses suggests that the resistance genes from these 3 different *Lycopersicon* species are allelic. This evidence agrees with Pitblado and Kerr (75) who found bacterial speck resistance to be a monogenic dominant trait in Ontario 7710. This cultivar already has many of the plant and fruit characteristics desired in a machine-harvested processing tomato and is being used in commercial breeding programs (75). The use of PI 112215 or PI 129157 as sources of bacterial speck resistance would be of doubtful value, unless it is in conjunction with the transfer of other useful traits. Either line might serve as a source of multiple disease resistance. PI 112215 has been reported to possess resistance to early blight (2), target leafspot (10), cladosporium leafmold (44), and bacterial wilt (2). PI 129157 carries resistance to both carmine and two-spotted spider mite (39), and early blight (2).

Parental and F_1 plants were also tested by infiltration inoculation (54). Ontario 7710, PI 112215, PI 129157, and all F_1 plants produced a hypersensitive reaction (HR) to inoculation. The first visible symptoms were watersoaking of the inoculated areas. Tissue collapse and desiccation

followed soon thereafter. Total time for the development of these symptoms was 20 to 24 hours. Chico III produced similar symptoms; however, symptom development took longer, with tissue collapse and necrosis occurring between 48 to 72 hours after inoculation. With the exception of PI 129157, all of the hypersensitive lines reacted in a similar manner to inoculation. PI 129157 produced dark brown desiccated tissue, while the inoculated areas of Ontario 7710, PI 112215, and all F_1 plants became a light grayish-green in color.

Hypersensitive reactions have been recognized as a plant defense mechanism against fungal and viral pathogens (67). More recently, it has been proposed as an important defense reaction against bacterial pathogens (54). Under natural conditions, the pathogenic bacterial cell enters the host and multiplies in the intercellular spaces or vessels. In the hypersensitive plant, the surrounding host cells react to the pathogen by dying, which walls off the pathogen and limits its multiplication. These reactions occur at the cellular level and are invisible to the unaided eye (100). However, the intercellular infiltration of high numbers of bacterial cells results in such extensive cell necrosis that large areas of tissue collapse and the reaction becomes visible. Thus, macroscopic hypersensitivity symptoms are believed to be evidence of a disease resistance mechanism normally operating, unseen, at the cellular level.

SUMMARY AND CONCLUSIONS

In 1980, 4,408 accessions of *Lycopersicon* spp. were received for evaluation from the North Central Regional Plant Introduction Station, Ames, Iowa. The collection included representatives of many species including *L. esculentum*, including form *pyriforme* and variety *cerasiforme*, *L. glandulosum*, *L. hirsutum*, including form *glabratum*, *L. peruvianum*, including variety *dentatum* and *humifusum*, *L. cheesmanii* form *minor*, *L. pimpinellifolium*, various genetic stocks, and known or suspected species crosses (87). All accessions received were screened for resistance to *Xanthomonas campestris* pv. *vesicatoria*, causal agent of bacterial spot of tomato. In addition, 540 selected lines representing all of the above species were screened for resistance to *Pseudomonas syringae* pv. *tomato*, causal agent of bacterial speck of tomato.

No lines exhibited a symptomless reaction to spray inoculation with *X. campestris* pv. *vesicatoria*. This was unexpected, since hypersensitive resistance to the pathogen has been found in *Capsicum* spp. (94). Twenty-five accessions did receive a disease index (DI) of 50 or less, while 565 lines received a DI of 75 or less. DI scores which are less than 100 suggest that a line is less susceptible than Chico III. PI 114490, *L. esculentum*, used as a resistant check in many of the screenings, received a DI of 61 based on 1,423 plant evaluations. The expression of this intermediate level of resistance was variable and seemed to be influenced by environmental factors. For this reason, additional work would be more efficient if rigid control of defined environmental conditions and inoculation methods is exercised.

Evaluation of the 540 lines for reaction to spray inoculation with *P. syringae* pv. *tomato* revealed large differences in susceptibility to the pathogen. Twenty-six percent of the tested lines received a DI of 10 or less, while forty-four percent received a DI of 50 or less. Unlike the bacterial spot evaluations, many plants exhibited a symptomless reaction to spray inoculation with the pathogen. This type of resistance was observed in the *L. esculentum*, *L. glandulosum*, *L. hirsutum*, *L. hirsutum* f. *glabratum*, *L. peruvianum* including its varieties *dentatum* and *humifusum*, *L. pimpinellifolium*, and in several lines identified as species crosses. The prevalence of resistance among the wild *Lycopersicon* suggests that a systematic screening of commercial cultivars and breeding lines for resistance might be productive. Identification and use of a resistance source genetically different from that found in Ontario 7710 should be sought. Several lines, such as Campbell 28, possess an intermediate level of resistance. A combination of this type of resistance with the single gene resistance found in Ontario 7710 might be more durable if the bacterial speck pathogen proves to be variable for pathogenicity.

To investigate the source of bacterial speck resistance in PI 112215, *L. pimpinellifolium*, and PI 129157, *L. hirsutum* f. *glabratum*, a diallel crossing scheme was initiated with Ontario 7710 and the susceptible cultivar Chico III. Resistant parents and all F_1 progeny from the diallel produced hypersensitive reactions (54) after foliage infiltration inoculation with 1×10^8 CFU/ml of *P. syringae* pv. *tomato*. Spray inoculation of the F_1 and F_2 populations produced segregation ratios that suggest a single dominant gene conditioned resistance in each of the 3 lines. The lack of

susceptible segregates in resistant x resistant crosses suggests that the 3 different sources of resistance are based on the same set of genes. Either PI 112215 or PI 129157 could act as a source of multiple disease resistance in a breeding program (2, 10, 39, 44). However, no evidence was found suggesting that the bacterial speck resistance in these 2 lines is superior or different from that found in Ontario 7710.

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APPENDIX A.

COMPUTER PRINTOUT

SPECIES KEY

Species	Code
Commercial cultivars	1
Verified gene stocks	2
Tetraploids	3
Auto-diploids	4
Male steriles and other unfruitfuls	5
Lycopersicon glandulosum	6
Lycopersicon hirsutum	7
Lycopersicon hirsutum, f. *glabratum*	8
Lycopersicon peruvianum including var. *dentatum*	9
Lycopersicon peruvianum var. *humifusum*	10
Lycopersicon cheesmanii f. *minor*	11
Lycopersicon pimpinellifolium	12
L. esculentum X *L. hirsutum*	13
L. esculentum X *L. peruvianum*	14
L. esculentum X *L. pimpinellifolium*	15
L. esculentum X *L. pimpinellifolium* (suspected)	16
L. esculentum including f. *pyriforme*	17

SOURCE KEY

Source	Code	Source	Code
COMMERCIAL CULTIVARS	1	ITALY	44
AFGHANISTAN	2	JAPAN	45
ARGENTINA	3	KENYA	46
AUSTRALIA	4	LEBANON	47
BALEARICS	5	MALAWI	48
BALUCHISTAN	6	MALAYSIA	49
BOLIVIA	7	MANCHURIA	50
BRAZIL	8	MEXICO	51
BRITISH GUIANA	9	MOROCCO	52
BULGARIA	10	NEPAL	53
CANADA	11	NETHERLANDS	54
CANARY ISLANDS	12	NEW CALEDONIA	55
CEYLON	13	NEW GUINEA	56
CHILE	14	NEW ZEALAND	57
CHINA	15	NICARAGUA	58
CHINA, PRC	16	NIGERIA	59
CHINA, TAIWAN	17	NORWAY	60
COLOMBIA	18	PALESTINE	61
COOK ISLANDS	19	PANAMA	62
COSTA RICA	20	PERU	63
CUBA	21	PHILIPPINES	64
CZECHOSLOVAKIA	22	POLAND	65
EAST AFRICA	23	PUERTO RICO	66
ECUADOR	24	ROMANIA	67
EGYPT	25	SCOTLAND	68
EL SALVADOR	26	SOUTH AFRICA	69
ENGLAND	27	SOUTH AMERICA	70
ETHIOPIA	28	SPAIN	71
FRANCE	29	SWEDEN	72
FRENCH GUIANA	30	SWITZERLAND	73
GERMANY	31	SYRIA	74
GHANA	32	TASMANIA	75
GREAT BRITAIN	33	THAILAND	76
GREECE	34	TURKEY	77
GUADELOUPE	35	URUGUAY	78
GUATEMALA	36	USA	79
HONDURAS	37	USSR	80
HUNGARY	38	VENEZUELA	81
INDIA	39	WEST PAKISTAN	82
IRAN	41	YUGOSLAVIA	83
IRAG	42	ZAIRE	84
ISRAEL	43		

PI CODE		SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
1	1		2490	2.90	0.78	100	407	2.64	0.60	100	CHICO III	1
3	1		32	2.13	0.94	75	339	0.06	0.24	2	ONTARIO 7710	1
5	1		4	1.00	0.82	44	4	3.00	0.00	100	RUTGERS	1
6	1		16	2.25	0.77	114	4	3.00	0.00	100	NOVA	1
7	1		11	1.00	0.45	55	4	1.50	0.58	60	CAMPBELL 28	1
8	1		4	1.00	0.82	44	3	2.33	0.58	78	ROMA VF	1
9	1						4	3.00	0.00	100	ROADSIDE RED	1
11	1						4	3.00	0.00	100	MOCROSS SUPREME	1
12	1						4	2.50	0.58	111	ACE 55 VF	1
13	1		4	3.00	0.00	150	4	0.00	0.00	0	SWEET 100	1
14	1		5	1.60	0.55	100	4	2.75	0.50	100	HEINZ 722	1
15	1		8	1.75	0.46	105	4	2.25	0.96	75	HEINZ 1439	1
16	1		8	1.38	0.52	75	4	2.75	0.50	92	HEINZ 1370	1
17	1		8	1.88	0.99	95	4	2.50	0.58	100	CARIBE	1
18	1		4	1.75	0.50	140	4	2.50	0.58	100	COLDSET	1
19	1		23	2.87	0.81	128	4	3.00	0.00	100	WALTER	1
20	1		18	2.22	0.73	75						1
21	1		20	1.95	0.89	83	4	3.00	0.00	100	HEINZ 420	1
22	1		20	1.95	0.76	84	4	1.75	0.50	58	HEINZ 830	1
23	1		19	1.79	0.98	76	4	2.25	0.50	75	HEINZ 2990	1
25	1		4	4.00	0.00	107	4	2.50	0.58	100	HEINZ 1784	1
26	1		8	3.00	1.07	93	4	3.00	0.00	100	HEINZ 1129	1
27	1		11	2.55	1.04	89	3	3.00	0.00	100	HEINZ 1036	1
28	1		4	2.50	0.58	100	4	2.50	0.58	83	OHIO 7814	1
29	1		4	2.25	0.50	90	3	3.00	0.00	100	OHIO 7681	1
30	1						8	2.50	0.53	95	OREGON CHERRY	1
31	1		4	2.75	0.50	138	12	2.42	0.51	88	DROPLET	1
32	1		4	2.00	0.00	100	6	0.33	0.82	10	SUBARTIC DELIGHT	1
33	1		4	2.50	0.58	125	4	2.00	0.82	67	BURGIS	1
34	1		4	1.75	0.50	88	4	2.50	0.58	83	FLORDIA 1A	1
35	1		4	2.00	0.00	100	4	3.25	0.50	108	FLORIDA 1B	1
36	1		4	3.00	0.00	150	4	3.25	0.50	108	FLORIDA 1C	1
37	1		4	1.75	0.50	88	4	3.50	0.58	117	FLORIDA 2432	1
38	1		4	1.50	0.58	75	4	3.00	0.00	100	HAYSLIP	1
39	1						4	2.75	0.50	110	AMEX VFN	1
40	1						4	3.00	0.00	120	CAL-J	1
41	1						4	3.00	0.00	120	CAMPBELL 1327	1
42	1						4	3.00	0.00	120	CARO RICH	1
43	1						3	2.00	0.00	80	CASTLEX 1025	1
44	1						4	2.50	0.58	83	CONTESSA	1
45	1						4	2.50	0.58	83	COUNT	1
46	1						4	2.50	0.58	83	DUCHESS	1
47	1						4	2.75	0.50	92	DUKE	1
48	1						4	2.75	0.50	92	FLORAMERICA	1
49	1						4	2.50	0.58	83	GLAMOUR	1
50	1						4	2.25	0.50	75	HEINZ 1350	1
51	1						3	2.67	0.58	89	HEINZ 1409	1
52	1						4	3.00	0.00	100	MANALUCIE	1
53	1						4	0.00	0.00	0	NIAGARA 315 VF	1
54	1						4	2.50	0.58	83	NIAGARA 317 VF	1

PI CODE		SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
55	1						4	1.25	0.50	42	OHIO 736	1
56	1						4	2.25	0.50	75	ONTARIO 7714	1
57	1						4	3.00	0.00	100	RED ROCK	1
58	1						4	2.00	1.15	67	GREEN RIPENING MUT.	1
59	1						3	2.67	0.58	89	VEEROMA VF	1
60	1						3	2.67	0.58	97	VEEPICK	1
61	1						4	2.50	0.58	91	WALTER VILLEMAIRE	1
62	1						4	2.75	0.50	100	TROPIC	1
63	1						4	3.00	0.00	109	PETO 81	1
64	1						4	3.00	0.00	109	PETO EARLY	1
65	1						4	2.50	0.58	91	PETOGRO	1
66	1						4	3.00	0.00	109	PETOMECH II	1
67	1						4	2.50	0.58	91	PETOPEAR #1	1
65023	5	BALEARICS	4	1.75	0.96	78						17
79532	63	PERU	4	1.50	0.58	67	8	2.25	0.89	129	PAN AMERICA	12
91458	68	SCOTLAND	8	2.38	1.41	68					PRIMROSE GAGE	17
91907	10	BULGARIA	4	3.00	0.82	86						17
91908	10	BULGARIA	4	3.00	0.82	86						17
91909	10	BULGARIA	4	2.25	0.96	64						17
91911	10	BULGARIA	8	2.50	1.20	71						17
91912	10	BULGARIA	4	3.50	0.58	100						17
91913	10	BULGARIA	4	3.00	0.82	86						17
91914	10	BULGARIA	4	2.75	0.50	79						17
91916	10	BULGARIA	4	3.50	0.58	100						17
91917	10	BULGARIA	4	2.50	0.58	83						17
91918	10	BULGARIA	4	3.25	0.50	108						17
91919	10	BULGARIA	4	3.00	0.82	100						17
92356	51	MEXICO	4	3.00	0.00	100						17
92853	15	CHINA	4	2.00	0.82	67						17
92854	15	CHINA	4	2.25	0.50	75						17
92855	15	CHINA	4	2.75	0.50	92						17
92856	15	CHINA	4	2.75	0.50	92						17
92857	15	CHINA	4	2.50	0.58	83						17
92858	15	CHINA	4	2.00	1.15	62						17
92859	15	CHINA	4	2.50	0.58	77						17
92860	15	CHINA	4	3.25	0.50	100						17
92861	15	CHINA	4	2.00	1.41	62						17
92862	15	CHINA	4	2.75	0.50	85						17
92863	50	MANCHURIA	4	2.25	0.96	100						17
92864	15	CHINA	3	2.67	0.58	82						17
92865	15	CHINA	4	2.25	0.96	69						17
92866	15	CHINA	4	2.50	0.58	77						17
93302	15	CHINA	4	2.25	0.96	69						17
95583	50	MANCHURIA	4	3.00	0.00	120						17
95584	50	MANCHURIA	4	3.25	0.50	130						17
95585	50	MANCHURIA	4	2.50	0.58	100						17
95586	50	MANCHURIA	4	3.00	0.82	120						17
95587	50	MANCHURIA	8	2.63	1.30	84						17
95588	50	MANCHURIA	8	2.63	0.92	86						17
95589	50	MANCHURIA	8	2.50	0.93	85						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
95590	50 MANCHURIA	4	1.50	0.58	60						17
95591	50 MANCHURIA	4	2.50	0.58	100						17
95592	50 MANCHURIA	4	3.25	0.96	87						17
97321	51 MEXICO	4	2.75	0.96	73						17
97538	3 ARGENTINA	4	4.00	0.00	107					CHERRY	17
98097	21 CUBA	4	2.75	0.50	73					RINON	17
99782	63 PERU	4	2.25	0.96	100						17
100697	63 PERU	4	2.50	0.58	67						17
102713	80 USSR	4	3.50	0.58	93					TSHUDORYNKA	17
102714	80 USSR	4	3.75	0.50	100						17
102715	80 USSR	4	3.50	0.58	93						17
102716	80 USSR	4	3.75	0.50	100						17
102717	80 USSR	4	2.75	0.50	85						17
102719	80 USSR	4	2.00	0.82	62						17
102720	80 USSR	4	3.50	0.58	108						17
102721	80 USSR	4	2.75	0.50	85						17
102722	80 USSR	4	2.00	0.82	62						17
102724	80 USSR	4	2.25	0.96	69						17
102725	80 USSR	4	2.75	0.50	85						17
102884	15 CHINA	4	2.00	1.15	62						17
102885	15 CHINA	4	2.00	0.82	62						17
102886	15 CHINA	4	3.75	0.50	107						17
103055	15 CHINA	4	3.75	0.50	107						17
105225	4 AUSTRALIA	4	2.75	0.96	79						17
105266	77 TURKEY	4	2.75	1.26	79						17
105267	77 TURKEY	4	3.50	0.58	100						17
105342	15 CHINA	4	3.00	0.82	86						17
106997	9 BRITISH GUIANA	4	3.25	0.50	93					CREOLE	17
108244	31 GERMANY	4	2.25	0.96	64					BACCIS LUTEIS	17
108245	31 GERMANY	4	2.00	0.82	57	8	2.00	0.93	77		17
108246	31 GERMANY	4	2.75	0.50	85						17
109112	77 TURKEY	4	3.00	0.00	92						17
109113	77 TURKEY	4	3.50	0.58	108						17
109315	77 TURKEY	4	3.50	0.58	108						17
109316	77 TURKEY	3	3.67	0.58	113						17
109512	77 TURKEY	4	2.50	1.00	77						17
109513	77 TURKEY	4	3.00	0.00	92						17
109514	77 TURKEY	4	3.00	1.41	92						17
109831	52 MOROCCO	4	2.50	0.58	77					DE MARMANDE	17
109832	52 MOROCCO	4	1.50	0.58	67	4	2.50	0.58	83	DES ALLIES	17
109833	52 MOROCCO	4	3.50	0.58	88					JOFFRE	17
109834	52 MOROCCO	4	4.00	0.00	100					MERVILLE DES MARCHES	17
109835	52 MOROCCO	4	4.00	0.00	100					PIERRETTE	17
109836	52 MOROCCO	4	3.50	0.58	88					PRECOCE DES HALLES	17
109837	52 MOROCCO	3	3.67	0.58	92					PREMIERE	17
109838	52 MOROCCO	4	3.50	0.58	88					PROFUSION	17
110595	27 ENGLAND	4	3.75	0.50	94	4	2.50	0.58	125		12
110596	27 ENGLAND	4	3.75	0.50	94						17
110597	27 ENGLAND	4	4.00	0.00	100						17
110946	18 COLOMBIA	4	2.50	0.58	71					OVITA	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
111406	62 PANAMA	4	3.00	0.00	86					MERCADO	17
111407	62 PANAMA	4	3.25	0.50	93					MONTE OSCURO	17
111408	62 PANAMA	4	3.25	0.50	93					PACORA	17
111409	62 PANAMA	4	2.00	0.82	57					SONA	17
112215	24 ECUADOR	43	2.19	0.98	70	56	0.05	0.23	2		12
112835	36 GUATEMALA	4	2.75	0.96	79	4	2.25	0.96	113		16
113516	25 EGYPT	4	3.00	0.82	86						17
114034	42 IRAQ	11	2.27	0.79	97						17
114038	37 HONDURAS	12	2.25	0.87	96	12	1.92	0.51	81		16
114490	27 ENGLAND	1423	1.83	0.92	61	4	1.25	0.50	63		17
114611	22 CZECHOSLOVAKIA	4	2.00	0.82	160						17
114965	13 CEYLON	4	2.00	0.82	160					TAKKALI	17
114966	25 EGYPT	13	2.38	1.19	95						17
114967	39 INDIA	4	1.75	0.50	140	4	1.75	0.96	88		16
114968	39 INDIA	4	2.25	0.96	100						17
114969	39 INDIA	4	2.50	1.00	111	4	2.50	0.58	125		17
115201	80 USSR	4	1.50	1.29	120					FIRST EARLY	17
115219	80 USSR	4	2.25	0.50	180					REINE DES HATIVES	17
115599	77 TURKEY	4	2.00	0.82	160						17
115601	77 TURKEY	8	1.50	1.20	58						17
115872	80 USSR	4	1.25	1.26	83					CHUDO RINKA	17
116047	39 INDIA	4	3.00	0.82	100						17
116219	52 MOROCCO	4	2.50	1.00	167						17
116526	39 INDIA	4	2.25	0.96	150						17
116954	39 INDIA	18	2.06	1.43	70						17
117222	77 TURKEY	16	2.00	1.10	74						17
117563	8 BRAZIL	4	2.00	1.15	133					SAO PAULO	17
117564	8 BRAZIL	4	2.00	1.15	133						17
117565	8 BRAZIL	4	2.25	0.50	150						17
117566	8 BRAZIL	4	1.50	1.29	75						17
117567	8 BRAZIL	4	1.50	0.58	75						17
117897	8 BRAZIL	7	1.71	1.38	69						17
117898	8 BRAZIL	8	1.38	1.30	48						17
117899	8 BRAZIL	8	1.25	1.04	49						17
117900	8 BRAZIL	4	1.50	0.58	75						17
118324	8 BRAZIL	4	2.50	0.58	125						17
118325	8 BRAZIL	4	2.00	0.82	100						17
118326	8 BRAZIL	4	1.75	0.50	88						17
118327	8 BRAZIL	4	1.75	0.96	88						17
118328	8 BRAZIL	4	2.50	0.58	125						17
118403	81 VENEZUELA	12	2.00	1.04	73	8	1.75	0.89	69		16
118404	81 VENEZUELA	4	1.75	0.96	88						17
118405	81 VENEZUELA	4	1.75	0.50	88	8	2.75	0.46	130		16
118406	81 VENEZUELA	4	2.50	0.58	111						17
118407	81 VENEZUELA	4	1.75	0.50	88	4	2.00	0.00	73		16
118408	81 VENEZUELA	4	2.00	0.82	100						17
118409	81 VENEZUELA	12	1.58	0.79	57	4	2.50	0.58	91		16
118611	39 INDIA	4	2.75	0.50	138						17
118685	8 BRAZIL	4	1.50	1.00	75						17
118686	8 BRAZIL	4	1.50	0.58	75						17

PI CODE		SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
118778	8	BRAZIL	4	1.75	1.50	58						17
118782	81	VENEZUELA	4	1.75	0.50	88						17
118783	81	VENEZUELA	11	1.82	0.40	70					RINON	17
118784	81	VENEZUELA	4	3.00	0.00	150	5	2.00	0.71	70		16
118785	81	VENEZUELA	4	2.25	0.96	113					LISO	17
118786	81	VENEZUELA	4	2.75	0.50	138	4	2.25	0.50	82	JOBO	16
118787	81	VENEZUELA	16	2.25	1.18	82						17
118788	81	VENEZUELA	4	1.50	0.58	75					ISLEA	17
118789	81	VENEZUELA	4	1.50	1.29	60						17
118790	81	VENEZUELA	4	1.75	0.50	70						17
119104	8	BRAZIL	4	2.25	0.50	90	8	2.38	0.52	86	PERFEICAO	16
119105	8	BRAZIL	4	1.50	0.58	60					RETIRO	17
119214	81	VENEZUELA	4	1.75	0.96	70	16	2.00	1.03	69		16
119215	81	VENEZUELA	4	3.25	0.50	130						17
119446	81	VENEZUELA	4	2.25	0.50	90						17
119776	3	ARGENTINA	4	2.75	0.50	110					LISO COLORADO ARGENTINO	17
119777	3	ARGENTINA	4	2.50	0.58	100					GRUESO LISO CHEMIN	17
119778	3	ARGENTINA	4	1.50	0.58	86					COLORADO GRUESO	17
120253	77	TURKEY	4	1.50	0.58	86						17
120254	77	TURKEY	4	2.00	0.00	114						17
120256	77	TURKEY	4	2.00	0.82	114						17
120257	77	TURKEY	4	3.00	0.00	171						17
120258	77	TURKEY	4	2.75	0.50	157						17
120259	77	TURKEY	4	3.00	0.82	171						17
120260	77	TURKEY	4	3.00	0.82	171						17
120261	77	TURKEY	4	2.50	0.58	143						17
120262	77	TURKEY	4	2.25	0.50	113						17
120263	77	TURKEY	4	3.25	0.50	163						17
120264	77	TURKEY	4	3.50	0.58	175						17
120265	77	TURKEY	4	2.25	0.96	113						17
120266	77	TURKEY	4	1.50	0.58	75						17
120267	77	TURKEY	8	1.75	0.71	72						17
120268	77	TURKEY	4	3.00	0.82	150						17
120269	77	TURKEY	4	3.00	0.82	150						17
120270	77	TURKEY	4	2.00	0.82	100						17
120271	77	TURKEY	4	1.75	0.96	70						17
120272	77	TURKEY	4	2.75	0.50	110						17
120273	77	TURKEY	4	2.25	0.96	90						17
120274	77	TURKEY	4	2.75	0.50	110						17
120275	77	TURKEY	4	2.50	0.58	100						17
120276	77	TURKEY	4	2.50	0.58	100						17
120277	77	TURKEY	4	3.00	0.82	120						17
120278	77	TURKEY	4	1.50	0.58	60						17
121345	39	INDIA	4	3.25	0.50	130						17
121436	39	INDIA	4	2.00	0.82	200						17
121437	39	INDIA	4	2.50	0.58	250						17
121438	39	INDIA	4	2.50	0.58	250						17
121662	11	CANADA	4	2.50	0.58	250					ABEL	17
121663	11	CANADA	4	2.50	0.58	250					ALACRITY	17
121664	11	CANADA	4	1.75	0.50	175					BESTAL	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
121665	11 CANADA	4	2.75	0.50	275					GLOBONNIE	17
121666	11 CANADA	4	2.50	0.58	250						17
121667	11 CANADA	4	3.00	0.00	300					PINK	17
123433	52 MOROCCO	4	1.75	0.50	88					AURORE	17
123434	52 MOROCCO	8	1.75	0.89	70					HATIF DE COLOGNE	17
123435	52 MOROCCO	4	2.00	0.00	100					GLORIA DE MORDIN	17
123436	52 MOROCCO	4	2.00	0.82	100					REINE DE REIVES	17
123437	52 MOROCCO	4	2.25	0.50	113					POTAGER DE VILJOULE	17
123438	52 MOROCCO	4	3.00	0.82	100	4	2.00	0.00	100	SANS PARCILLE	17
123538	39 INDIA	4	2.50	0.58	125						17
124034	63 PERU	4	3.00	0.00	150						17
124035	63 PERU	4	2.25	0.96	113						17
124036	3 ARGENTINA	8	1.75	0.71	72						17
124037	14 CHILE	8	1.88	0.99	73						17
124038	63 PERU	4	2.50	0.58	111						17
124039	63 PERU	4	2.75	0.50	122	8	2.63	0.74	92		12
124132	39 INDIA	4	2.25	0.96	100	4	2.00	0.82	73		16
124133	39 INDIA	4	3.00	0.00	133						17
124161	36 GUATEMALA	4	2.25	0.96	100						17
124162	36 GUATEMALA	4	2.75	0.96	122					MANZANA	17
124163	36 GUATEMALA	4	3.25	0.50	144					PISHITO	17
124235	39 INDIA	4	3.25	0.50	108						17
124473	39 INDIA	4	1.75	0.50	78						18
124474	39 INDIA	4	2.00	0.82	89						17
124581	39 INDIA	4	2.00	1.41	89						17
124582	39 INDIA	4	3.00	0.82	100						17
125830	2 AFGHANISTAN	4	2.25	0.96	100					BANJAN-I-RUMI	17
125831	2 AFGHANISTAN	4	1.25	0.50	56					RUMI BANJAN	17
126407	62 PANAMA	4	1.50	0.58	67						17
126408	62 PANAMA	4	2.25	0.96	75	4	1.25	0.50	63		17
126409	63 PERU	8	1.50	0.93	122						17
126410	63 PERU	12	2.08	1.31	102						17
126411	63 PERU	4	2.75	0.50	122						17
126412	63 PERU	4	2.00	0.82	114						17
126413	63 PERU	12	1.75	1.60	85						17
126414	63 PERU	3	1.67	1.15	95						17
126415	63 PERU	4	1.50	0.58	86						17
126416	63 PERU	4	1.50	0.58	86						17
126417	63 PERU	4	1.25	0.50	71						17
126418	63 PERU	8	1.63	1.51	152						17
126419	63 PERU	4	1.50	0.58	86						17
126420	63 PERU	4	1.75	0.50	100						17
126421	63 PERU	4	3.00	0.82	120						17
126422	63 PERU	4	3.25	0.50	130						17
126423	63 PERU	4	3.00	0.82	120						17
126424	63 PERU	4	2.00	0.82	80						17
126425	63 PERU	4	1.75	0.96	70						17
126426	63 PERU	4	1.25	0.50	50						17
126427	63 PERU	4	2.25	0.50	90						17
126428	63 PERU	4	1.50	0.58	60						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
126429 63	PERU	4	2.25	0.96	90						17
126430 63	PERU	4	2.50	1.00	83	12	0.17	0.39	6		12
126431 63	PERU	4	3.00	0.82	100	4	0.25	0.50	10		9
126432 63	PERU	4	2.50	1.00	100	12	0.00	0.00	0		12
126433 63	PERU	4	2.75	0.50	110	19	0.53	0.96	24		12
126434 63	PERU	4	2.50	1.00	100	4	0.75	0.50	33		6
126435 63	PERU	8	2.75	1.16	150	4	0.50	1.00	20		9
126436 63	PERU	4	1.50	0.58	60	8	0.00	0.00	0		12
126437 63	PERU	4	1.50	0.58	60	16	0.25	0.45	10		16
126439 63	PERU	8	2.25	1.04	120	4	0.75	0.50	30		9
126440 63	PERU	4	2.00	0.82	80	4	0.25	0.50	11		6
126441 63	PERU	4	3.00	0.82	120	4	0.25	0.50	10		9
126443 63	PERU	4	2.00	1.83	67	4	0.00	0.00	0		6
126444 63	PERU	4	2.75	1.50	110	4	0.00	0.00	0		6
126448 63	PERU	4	1.50	0.58	60	4	0.75	0.96	33		6
126449 63	PERU	4	2.50	0.58	100	4	0.50	0.58	17		8
126451 63	PERU	4	2.50	0.58	100						17
126452 63	PERU	4	2.00	0.82	80						17
126905 63	PERU	4	2.25	0.96	90	4	3.00	0.00	120		16
126906 63	PERU	4	3.25	0.96	118	4	2.25	0.50	113		17
126907 63	PERU	4	2.00	0.82	80						17
126908 63	PERU	4	2.25	0.96	90						17
126909 63	PERU	4	2.50	0.58	100						17
126910 63	PERU	4	3.00	1.41	109	4	1.00	0.82	50		17
126911 63	PERU	4	2.50	0.58	100						17
126912 63	PERU	3	2.00	1.00	114	12	1.92	0.51	72		16
126913 63	PERU	4	2.25	0.50	129						17
126914 63	PERU	4	2.00	0.82	114						17
126915 63	PERU	4	2.50	0.58	143	8	2.13	1.13	85		16
126916 63	PERU	4	2.75	0.50	157						17
126917 63	PERU	4	1.50	0.58	86						17
126918 63	PERU	4	2.00	1.15	114						17
126919 63	PERU	4	2.25	0.50	129						17
126920 63	PERU	4	1.00	0.82	57						17
126921 63	PERU	4	2.25	0.96	129						17
126922 63	PERU	4	2.50	0.58	143						17
126923 63	PERU	8	3.00	0.93	121	18	0.89	1.08	42		16
126924 63	PERU	4	2.00	0.82	114	12	0.25	0.62	10		12
126925 63	PERU	20	1.90	1.29	87	8	0.25	0.46	9		12
126926 63	PERU	4	2.50	1.00	143	4	0.00	0.00	0		9
126927 63	PERU	4	2.75	0.50	157	12	0.25	0.45	10		12
126928 63	PERU	4	1.50	0.58	86						9
126929 63	PERU	7	2.43	1.40	92						9
126930 63	PERU	8	1.88	0.99	84						9
126931 63	PERU	4	1.75	0.96	100	24	1.83	1.17	73		12
126932 63	PERU	4	2.50	0.58	91	12	0.58	0.90	39		12
126933 63	PERU	4	2.50	0.58	111	24	1.25	1.42	49		12
126934 63	PERU	4	2.50	1.00	111	20	1.45	1.39	62		12
126935 63	PERU	4	2.00	0.82	89						9
126936 63	PERU	4	2.00	0.82	160	8	1.00	0.53	40		12

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
126937	63 PERU	4	3.00	0.00	133	8	0.25	0.46	8		12
126938	63 PERU	8	2.38	0.74	97	8	0.13	0.35	4		12
126939	63 PERU	8	1.75	0.71	70	20	0.65	1.04	27		12
126940	63 PERU	4	2.50	1.00	111	4	3.25	0.96	130		12
126941	63 PERU	8	1.25	1.04	111	11	1.18	1.08	39		12
126942	63 PERU	4	2.00	0.82	89						17
126943	63 PERU	4	2.75	0.50	138	3	3.00	0.00	120		16
126944	63 PERU	4	1.75	0.96	88						9
126945	63 PERU	4	2.00	1.15	100						9
126947	63 PERU	4	2.25	0.96	113	4	3.50	0.58	140		12
126948	63 PERU	8	1.88	0.83	84	7	2.86	0.38	139		16
126949	63 PERU	8	1.25	0.71	106	8	0.38	1.06	15		12
126950	63 PERU	4	2.50	0.58	125						17
126951	63 PERU	4	2.75	0.50	138	4	2.50	0.58	125		16
126952	63 PERU	4	2.25	0.96	113	11	0.91	0.94	38		12
126953	63 PERU	4	1.25	0.96	71	16	1.25	0.93	51		12
126954	63 PERU	30	2.27	1.28	89	4	0.00	0.00	0		12
126955	63 PERU	4	2.25	0.50	129						17
127467	2 AFGHANISTAN	4	2.00	0.82	114						17
127468	2 AFGHANISTAN	4	2.00	0.82	114						17
127794	63 PERU	10	1.60	0.84	119						17
127795	63 PERU	4	3.00	0.82	100	4	2.75	0.50	138		17
127796	63 PERU	4	1.25	0.50	71						17
127797	63 PERU	4	2.75	0.50	92	3	2.00	0.00	100		17
127798	63 PERU	4	3.50	0.58	117	4	3.00	0.00	100		17
127799	63 PERU	4	1.25	0.96	71	4	2.25	0.96	113		16
127800	63 PERU	4	1.25	1.26	71						17
127801	63 PERU	8	2.75	0.89	92						17
127802	63 PERU	4	2.75	1.26	92	4	3.00	0.00	100		17
127803	63 PERU	4	2.25	0.50	75						17
127804	63 PERU	4	3.00	0.82	100						17
127805	63 PERU	4	2.50	1.29	83	23	1.26	1.21	43		12
127806	63 PERU	4	2.25	0.96	75	12	1.08	1.31	46		12
127807	63 PERU	4	1.50	1.00	50	8	0.25	0.71	8		12
127808	63 PERU	4	1.00	0.00	33						17
127810	63 PERU	8	1.75	0.89	142						17
127811	63 PERU	4	1.75	0.96	58						17
127812	63 PERU	4	3.00	0.82	100						17
127813	63 PERU	4	1.50	0.58	67						17
127814	63 PERU	4	1.25	0.50	56						17
127815	63 PERU	4	2.75	0.50	122						17
127816	63 PERU	4	1.50	1.00	67						17
127817	63 PERU	4	3.50	0.58	117	4	3.00	0.00	100		17
127818	63 PERU	4	2.50	0.58	83	4	1.25	0.50	42		17
127819	7 BOLIVIA	12	3.00	1.35	85						17
127820	7 BOLIVIA	12	3.00	1.04	90						17
127821	7 BOLIVIA	22	2.32	0.57	87						17
127822	7 BOLIVIA	10	3.00	1.41	84						17
127823	7 BOLIVIA	12	3.08	1.24	91						17
127824	7 BOLIVIA	4	3.00	0.00	100	4	2.50	0.58	83		17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
127825	63 PERU	12	2.83	0.94	87						17
127826	63 PERU	20	2.20	0.52	80	4	0.00	0.00	0		7
127828	63 PERU	4	3.25	0.96	144	4	2.50	0.58	100		10
127829	63 PERU	8	2.63	1.19	117	4	1.25	0.96	50		10
127830	63 PERU	4	2.00	0.82	57						9
127831	63 PERU	12	3.00	0.85	81						9
127832	63 PERU	4	3.00	0.00	86						9
127833	63 PERU	4	2.50	0.58	71	8	0.00	0.00	0		12
128174	36 GUATEMALA	4	3.00	0.00	86						17
128178	36 GUATEMALA	4	2.25	0.50	64					MANZANA	17
128194	51 MEXICO	4	2.50	0.58	71	4	2.00	0.00	89		16
128214	3 ARGENTINA	4	3.50	0.58	100						17
128215	7 BOLIVIA	4	1.75	0.96	50						17
128216	7 BOLIVIA	4	2.00	0.00	57						17
128217	7 BOLIVIA	16	3.38	0.96	89						17
128218	7 BOLIVIA	4	3.75	0.50	107						17
128219	7 BOLIVIA	4	2.75	0.50	79						17
128220	7 BOLIVIA	4	2.75	0.50	79						17
128221	7 BOLIVIA	4	3.25	0.96	93						17
128222	7 BOLIVIA	4	3.50	0.58	100						17
128223	7 BOLIVIA	4	3.50	0.58	100						17
128224	7 BOLIVIA	4	3.25	0.50	93						17
128225	7 BOLIVIA	4	3.50	0.58	93						17
128226	7 BOLIVIA	4	2.50	0.58	67						17
128227	7 BOLIVIA	4	3.50	0.58	93						17
128228	7 BOLIVIA	4	3.00	0.00	80						17
128229	7 BOLIVIA	11	3.00	0.89	78						17
128230	7 BOLIVIA	4	3.50	0.58	93						17
128231	7 BOLIVIA	4	2.75	0.50	73						17
128232	7 BOLIVIA	4	3.25	0.50	87						17
128233	7 BOLIVIA	4	3.00	0.00	80						17
128234	7 BOLIVIA	4	3.00	0.00	86						17
128235	7 BOLIVIA	4	3.50	0.58	100						17
128236	7 BOLIVIA	4	3.50	0.58	100						17
128237	7 BOLIVIA	4	3.25	0.50	93						17
128238	7 BOLIVIA	4	3.00	0.00	86						17
128239	7 BOLIVIA	4	3.00	0.00	86						17
128240	7 BOLIVIA	4	4.00	0.00	114						17
128241	7 BOLIVIA	4	2.00	0.82	89	4	2.25	0.50	75		17
128242	7 BOLIVIA	4	3.75	0.50	107						17
128243	7 BOLIVIA	4	3.25	0.50	93						17
128244	7 BOLIVIA	4	3.00	0.00	86						17
128245	7 BOLIVIA	4	3.25	0.50	93						17
128246	7 BOLIVIA	4	3.50	0.58	100						17
128247	7 BOLIVIA	4	3.25	0.50	93						17
128248	7 BOLIVIA	4	3.25	0.50	93						17
128249	7 BOLIVIA	4	3.50	0.58	100						17
128250	7 BOLIVIA	14	2.64	0.74	74						17
128251	7 BOLIVIA	12	3.00	0.95	79						17
128252	7 BOLIVIA	27	2.37	0.93	74						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
128253	7 BOLIVIA	4	2.75	0.50	110						17
128254	7 BOLIVIA	4	2.75	0.96	110						17
128255	7 BOLIVIA	4	3.25	0.50	130						17
128256	7 BOLIVIA	4	2.50	1.00	100						17
128257	7 BOLIVIA	4	3.00	0.00	120						17
128258	7 BOLIVIA	4	3.25	0.50	130						17
128259	7 BOLIVIA	4	3.75	0.50	150						17
128260	7 BOLIVIA	4	3.50	0.58	140						17
128261	7 BOLIVIA	4	3.00	0.82	120						17
128262	7 BOLIVIA	4	3.00	0.00	80						17
128263	7 BOLIVIA	4	4.00	0.00	107						17
128264	7 BOLIVIA	4	3.75	0.50	100						17
128265	7 BOLIVIA	4	3.25	0.50	87						17
128266	7 BOLIVIA	4	3.00	0.82	80						17
128267	7 BOLIVIA	4	3.75	0.50	100						17
128268	7 BOLIVIA	4	3.50	0.58	93						17
128269	7 BOLIVIA	4	3.75	0.50	100						17
128270	7 BOLIVIA	4	3.25	0.50	87						17
128271	7 BOLIVIA	4	3.00	0.82	80						17
128272	3 ARGENTINA	4	3.25	0.50	87						17
128273	3 ARGENTINA	4	3.50	0.58	93						17
128274	3 ARGENTINA	4	3.50	0.58	93						17
128275	3 ARGENTINA	4	3.50	0.58	93						17
128276	3 ARGENTINA	4	3.00	0.82	80						17
128277	3 ARGENTINA	4	3.00	0.82	80						17
128278	3 ARGENTINA	4	3.75	0.50	100						17
128279	3 ARGENTINA	4	3.25	0.50	87						17
128280	3 ARGENTINA	4	3.75	0.50	100						17
128281	3 ARGENTINA	4	2.75	0.50	73						17
128282	3 ARGENTINA	4	4.00	0.00	107						17
128283	3 ARGENTINA	4	3.75	0.50	100						17
128285	3 ARGENTINA	4	3.00	0.82	80						17
128286	3 ARGENTINA	4	3.25	0.50	87						17
128287	3 ARGENTINA	4	3.25	0.50	87						17
128288	3 ARGENTINA	4	3.00	0.82	80						17
128289	3 ARGENTINA	16	3.13	0.96	99						17
128291	3 ARGENTINA	16	3.44	0.96	89						17
128292	3 ARGENTINA	12	3.25	1.06	86						17
128293	3 ARGENTINA	4	3.25	0.96	93						17
128294	3 ARGENTINA	28	2.71	0.90	89						17
128338	11 CANADA	4	3.50	0.58	100					HARKNESS	17
128445	3 ARGENTINA	8	1.88	0.99	74						17
128446	14 CHILE	4	1.75	1.50	100						17
128447	14 CHILE	4	2.00	0.82	114						17
128448	14 CHILE	8	1.88	0.83	74						17
128449	14 CHILE	4	2.50	1.29	143						17
128586	14 CHILE	4	2.50	0.58	143						17
128587	14 CHILE	4	1.75	0.50	100						17
128588	14 CHILE	4	2.50	0.58	143						17
128589	14 CHILE	4	2.50	0.58	143						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
128590	14 CHILE	4	2.75	0.96	157						17
128591	14 CHILE	4	1.50	0.58	86						17
128592	14 CHILE	4	1.75	0.96	100						17
128593	14 CHILE	12	1.83	1.27	61						17
128594	14 CHILE	4	1.50	0.58	86						17
128595	14 CHILE	4	2.00	0.82	114						17
128596	14 CHILE	4	2.00	0.82	114						17
128597	14 CHILE	4	1.50	1.29	86						17
128598	14 CHILE	4	1.50	1.00	86						17
128599	14 CHILE	4	2.25	0.50	100						17
128600	14 CHILE	4	2.25	0.50	100						17
128601	14 CHILE	4	1.50	0.58	67						17
128602	14 CHILE	8	2.13	1.25	74						17
128603	14 CHILE	4	2.00	0.82	89						17
128604	14 CHILE	4	2.25	0.96	100						17
128605	14 CHILE	12	1.83	0.72	70						17
128606	14 CHILE	4	1.50	0.58	67						17
128607	14 CHILE	4	2.00	0.82	89						17
128608	14 CHILE	8	1.88	0.99	66						17
128609	14 CHILE	4	2.50	0.58	111						17
128610	14 CHILE	4	2.25	0.96	100						17
128611	14 CHILE	8	1.75	0.89	61						17
128613	14 CHILE	4	2.00	0.82	89						17
128614	14 CHILE	4	2.00	0.82	89						17
128615	14 CHILE	4	2.75	0.96	122						17
128616	14 CHILE	4	2.50	0.58	111						17
128617	14 CHILE	4	1.75	0.50	78						17
128618	14 CHILE	3	3.00	0.00	90						17
128619	14 CHILE	3	2.33	0.58	70						17
128620	14 CHILE	4	2.75	0.50	82						17
128621	14 CHILE	4	2.50	0.58	75						17
128623	14 CHILE	3	2.33	0.58	70						17
128624	14 CHILE	4	2.75	0.50	275						17
128625	63 PERU	4	2.50	0.58	75						17
128626	63 PERU	4	2.50	0.58	75						17
128627	63 PERU	4	2.75	0.50	82						17
128628	63 PERU	3	2.33	0.58	117						17
128629	63 PERU	4	1.50	0.58	75						17
128630	63 PERU	16	1.94	1.00	72						17
128631	63 PERU	4	1.75	0.96	88						17
128632	63 PERU	4	2.50	0.58	125						17
128633	63 PERU	4	3.00	0.82	150						17
128634	63 PERU	4	2.50	1.00	125						17
128635	63 PERU	4	2.75	0.50	138						17
128636	63 PERU	4	2.75	1.26	138						17
128637	63 PERU	4	2.25	0.96	113						17
128638	63 PERU	4	2.50	0.58	125						17
128639	63 PERU	4	1.75	0.96	88	11	1.00	1.00	39		16
128640	63 PERU	4	2.25	0.96	113						17
128641	63 PERU	3	1.67	0.58	83						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
128642	63 PERU	8	1.75	0.89	66						17
128643	63 PERU	3	3.33	0.58	167						9
128644	63 PERU	4	3.00	0.00	92						7
128645	14 CHILE	4	1.75	0.50	88						9
128646	14 CHILE	4	2.00	1.41	100						9
128647	14 CHILE	4	3.00	0.82	150						9
128648	14 CHILE	4	2.00	0.82	89						9
128649	14 CHILE	4	2.25	0.96	100	4	0.50	0.58	20		9
128650	14 CHILE	4	2.75	0.50	122	4	0.00	0.00	0		9
128651	14 CHILE	4	2.75	0.50	122	4	0.00	0.00	0		9
128652	14 CHILE	4	2.25	1.50	100	4	0.00	0.00	0		9
128653	14 CHILE	11	2.27	0.79	90	4	0.00	0.00	0		9
128654	14 CHILE	4	2.75	0.50	122						9
128655	14 CHILE	4	3.00	0.00	133						9
128656	14 CHILE	4	2.50	0.58	111						9
128657	63 PERU	4	2.00	0.82	67						9
128658	63 PERU	4	2.75	0.50	92						9
128659	63 PERU	4	2.75	0.50	92	4	0.75	0.96	43		9
128660	63 PERU	4	1.50	0.58	50	4	0.00	0.00	0		9
128661	63 PERU	4	1.75	0.96	58	4	0.00	0.00	0		9
128663	63 PERU	4	1.75	0.50	58	4	0.00	0.00	0		9
128664	63 PERU	4	2.50	0.58	83	12	1.67	1.07	67		16
128884	29 FRANCE	4	2.25	0.96	75					DE MARMANDE	17
128885	29 FRANCE	4	2.75	0.50	92					MIKADO ECARLATE	17
128886	29 FRANCE	4	2.00	0.00	100					MERVEILLE DES MARCHES	17
128887	29 FRANCE	8	2.00	0.93	74						17
128888	29 FRANCE	6	1.33	1.21	57					REINE DES HATIVES	17
128889	29 FRANCE	4	1.75	0.50	88					ROI HUMBERT	17
128890	29 FRANCE	16	2.31	1.14	89					ROUGE GROSSE	17
128990	3 ARGENTINA	4	2.00	0.00	100					SAN MARZANO	17
129018	63 PERU	4	2.50	0.58	125						17
129019	63 PERU	8	1.38	1.06	47						17
129021	24 ECUADOR	4	2.75	0.50	138	12	1.17	1.11	44		16
129022	24 ECUADOR	4	3.00	0.00	75	10	1.00	0.94	44		16
129024	24 ECUADOR	4	2.75	0.96	69	3	2.33	0.58	104		16
129025	24 ECUADOR	4	3.50	0.58	88						17
129026	24 ECUADOR	4	3.00	0.82	75						17
129027	24 ECUADOR	4	3.50	0.58	88	12	1.42	1.00	54		16
129028	24 ECUADOR	4	3.75	0.50	94	8	2.13	0.83	77		16
129029	24 ECUADOR	4	3.50	0.58	88						17
129030	24 ECUADOR	4	3.25	0.96	81	12	0.75	0.87	26		16
129031	24 ECUADOR	4	3.75	0.50	94						17
129032	24 ECUADOR	4	3.25	0.50	81						17
129033	24 ECUADOR	4	3.50	0.58	88						17
129034	24 ECUADOR	4	3.50	0.58	88						17
129035	24 ECUADOR	4	4.00	0.00	100						17
129036	24 ECUADOR	4	3.50	0.58	88						17
129037	24 ECUADOR	4	3.25	0.96	81						17
129038	24 ECUADOR	4	3.50	0.58	88						17
129039	24 ECUADOR	4	3.00	0.82	75						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
129040	24 ECUADOR	4	3.75	0.50	94						17
129041	24 ECUADOR	4	3.75	0.50	94						17
129042	24 ECUADOR	4	3.75	0.50	94						17
129043	24 ECUADOR	4	3.75	0.50	94						17
129044	24 ECUADOR	4	3.00	0.82	75						17
129045	24 ECUADOR	4	4.00	0.00	100						17
129046	24 ECUADOR	11	2.27	0.65	84						17
129047	24 ECUADOR	3	4.00	0.00	100						17
129048	24 ECUADOR	4	3.75	0.50	94						17
129049	24 ECUADOR	3	4.00	0.00	100						17
129050	24 ECUADOR	12	2.00	1.48	54	4	2.00	0.00	67		17
129051	24 ECUADOR	4	3.50	0.58	88						17
129052	24 ECUADOR	4	4.00	0.00	100						17
129053	24 ECUADOR	4	3.75	0.50	94						17
129054	24 ECUADOR	4	3.50	0.58	88						17
129055	24 ECUADOR	4	3.75	0.50	94						17
129056	24 ECUADOR	8	2.88	1.13	91	4	1.75	0.50	58		17
129057	24 ECUADOR	3	3.00	1.00	75						17
129058	18 COLOMBIA	4	3.75	0.50	94						17
129059	18 COLOMBIA	4	3.75	0.50	94						17
129060	18 COLOMBIA	4	2.75	0.50	69						17
129061	18 COLOMBIA	32	2.66	0.65	89						17
129062	18 COLOMBIA	16	1.88	0.89	61	16	0.50	1.10	19		16
129063	18 COLOMBIA	4	4.00	0.00	100						17
129065	18 COLOMBIA	4	3.50	0.58	88						17
129066	18 COLOMBIA	3	3.67	0.58	92						17
129067	18 COLOMBIA	3	3.00	0.00	75						17
129068	18 COLOMBIA	4	3.50	0.58	88						17
129069	18 COLOMBIA	4	4.00	0.00	100						17
129070	18 COLOMBIA	8	2.38	1.06	74	4	2.75	0.50	122		17
129071	18 COLOMBIA	4	3.50	0.58	88						17
129072	18 COLOMBIA	4	3.75	0.50	94						17
129073	18 COLOMBIA	4	3.50	0.58	88						17
129074	18 COLOMBIA	4	3.25	0.50	81	4	2.50	0.58	83		16
129075	18 COLOMBIA	4	3.75	0.50	94						17
129076	18 COLOMBIA	4	3.50	0.58	88						17
129077	18 COLOMBIA	3	3.00	0.00	75						17
129078	18 COLOMBIA	4	3.50	0.58	88						17
129079	18 COLOMBIA	4	3.75	0.50	94						17
129080	18 COLOMBIA	8	2.50	1.41	77	4	2.25	0.50	100		17
129081	18 COLOMBIA	4	3.25	0.50	81						17
129082	18 COLOMBIA	17	2.29	0.69	70						17
129083	18 COLOMBIA	3	4.00	0.00	100						17
129084	18 COLOMBIA	4	3.50	0.58	88						17
129085	18 COLOMBIA	4	3.50	1.00	88						17
129086	18 COLOMBIA	8	3.38	0.74	103						17
129087	18 COLOMBIA	16	2.31	0.95	80						17
129088	18 COLOMBIA	7	2.14	0.69	98						17
129089	18 COLOMBIA	2	3.00	0.00	113						16
129090	18 COLOMBIA	8	3.38	0.92	102						16

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
129091	18 COLOMBIA	4	3.50	0.58	131						17
129092	18 COLOMBIA	12	2.17	0.39	91						17
129093	18 COLOMBIA	3	3.67	0.58	138						17
129094	18 COLOMBIA	4	3.25	0.96	122						17
129095	18 COLOMBIA	12	2.08	0.51	88						17
129096	18 COLOMBIA	16	2.31	0.60	90						17
129097	18 COLOMBIA	6	3.00	0.63	108						17
129098	18 COLOMBIA	8	3.38	0.52	118						17
129099	18 COLOMBIA	4	2.50	0.58	91						17
129100	18 COLOMBIA	4	3.50	0.58	127						17
129101	18 COLOMBIA	16	2.56	0.63	82						17
129102	18 COLOMBIA	4	3.00	0.00	109						17
129103	18 COLOMBIA	4	3.50	1.00	127						17
129104	18 COLOMBIA	4	3.25	0.50	118						17
129105	18 COLOMBIA	3	3.67	0.58	92	4	2.50	0.58	83		16
129106	18 COLOMBIA	4	3.25	0.96	81						17
129107	18 COLOMBIA	4	3.25	0.50	81						17
129108	18 COLOMBIA	4	3.75	0.50	94	4	2.25	0.50	75		16
129109	18 COLOMBIA	4	3.25	0.96	81						17
129110	18 COLOMBIA	3	3.33	0.58	83	4	2.25	0.50	75		16
129111	18 COLOMBIA	4	4.00	0.00	100						17
129112	18 COLOMBIA	8	2.25	0.46	66	10	1.60	0.97	56		16
129113	18 COLOMBIA	4	3.00	0.82	75						17
129114	18 COLOMBIA	20	2.30	0.86	81						17
129115	18 COLOMBIA	4	3.00	0.82	86						17
129116	18 COLOMBIA	4	3.50	0.58	100	8	1.75	0.71	67		16
129117	18 COLOMBIA	3	3.00	0.00	86						17
129118	18 COLOMBIA	16	2.13	0.50	79						17
129119	18 COLOMBIA	4	3.00	0.00	86						17
129120	18 COLOMBIA	4	2.75	0.50	79						17
129121	18 COLOMBIA	3	3.33	0.58	95	4	2.00	0.82	73		16
129122	18 COLOMBIA	3	3.00	1.00	86						17
129123	18 COLOMBIA	4	3.50	0.58	100						17
129124	18 COLOMBIA	4	3.00	0.82	80						17
129125	18 COLOMBIA	4	2.75	0.50	73						17
129126	62 PANAMA	4	3.25	0.50	87						17
129127	62 PANAMA	19	2.47	1.02	78						17
129128	62 PANAMA	20	2.25	0.91	74						17
129129	62 PANAMA	21	1.90	0.77	63						17
129130	62 PANAMA	4	3.00	0.00	80						17
129131	62 PANAMA	4	3.25	0.50	87						17
129132	3 ARGENTINA	4	3.75	0.50	100						17
129133	3 ARGENTINA	4	3.00	0.00	80						17
129134	3 ARGENTINA	4	2.50	1.29	67						17
129135	3 ARGENTINA	3	3.00	0.00	80	10	1.40	0.70	56		16
129136	3 ARGENTINA	4	3.00	0.82	80						17
129137	3 ARGENTINA	4	3.75	0.50	100						17
129138	3 ARGENTINA	7	2.43	0.53	72						17
129139	3 ARGENTINA	8	3.38	0.52	101						17
129140	3 ARGENTINA	3	3.00	0.00	109						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
129141	18 COLOMBIA	4	3.00	0.82	109						17
129142	24 ECUADOR	4	3.75	0.50	136						17
129143	63 PERU	4	3.75	0.50	136	7	0.00	0.00	0		16
129144	63 PERU	4	3.50	0.58	108	4	0.50	1.00	22		6
129145	63 PERU	4	3.50	0.58	127						9
129146	63 PERU	4	2.50	1.73	91						9
129148	24 ECUADOR	8	2.13	0.83	74	10	1.30	1.49	46		16
129149	24 ECUADOR	4	3.25	0.50	118						9
129152	24 ECUADOR	8	3.38	0.74	84						9
129154	24 ECUADOR	4	3.50	0.58	88	4	2.00	0.82	73		16
129155	24 ECUADOR	4	3.00	0.82	75	11	0.27	0.47	8		16
129156	24 ECUADOR	4	4.00	0.00	100	8	0.00	0.00	0		16
129157	24 ECUADOR	34	2.70	0.70	84	32	0.03	0.18	1		8
129686	24 ECUADOR	4	2.75	0.50	69	8	0.63	1.06	22		16
129687	3 ARGENTINA	4	3.25	0.50	81					CAMPANA	17
129688	3 ARGENTINA	4	4.00	0.00	100					CIRO	17
129689	3 ARGENTINA	4	3.75	0.50	94					LAS TALAS	17
129690	3 ARGENTINA	8	2.75	0.46	88					PALO BLANCO	17
129691	3 ARGENTINA	11	2.64	0.92	80					SINO	17
129692	3 ARGENTINA	4	3.50	0.58	108					VASELA	17
129693	63 PERU	4	3.25	0.50	100						17
129879	63 PERU	15	2.80	1.01	86						17
129880	63 PERU	3	3.33	0.58	103						17
129881	63 PERU	4	3.75	0.50	115						17
129882	63 PERU	4	3.00	0.00	92						17
131877	3 ARGENTINA	4	3.50	0.58	108					CAMPANA	17
131878	3 ARGENTINA	4	3.00	0.00	80					LOS TALAS	17
131879	3 ARGENTINA	4	3.00	0.00	80					PALO BLANCO	17
131880	3 ARGENTINA	3	2.00	0.00	67					REY HUMBERTO	17
131881	3 ARGENTINA	4	3.50	0.58	93					SAN MARZANO	17
131882	3 ARGENTINA	3	3.00	0.00	80					VARELA	17
133210	14 CHILE	3	2.67	0.58	71						2
133541	24 ECUADOR	4	2.75	0.50	73						17
133542	24 ECUADOR	17	2.29	1.36	73	5	1.40	1.34	69		12
134208	39 INDIA	11	2.91	1.04	158						17
134355	24 ECUADOR	4	2.75	0.50	92						17
134417	24 ECUADOR	8	2.88	0.64	88	3	0.00	0.00	0		8
134418	24 ECUADOR	12	2.00	0.60	131	4	0.00	0.00	0		8
135022	18 COLOMBIA	4	3.75	0.50	125	3	2.67	0.58	133		16
135842	2 AFGHANISTAN	4	3.50	0.58	117	3	2.33	0.58	117		16
135843	2 AFGHANISTAN	4	3.50	0.58	117						17
135844	2 AFGHANISTAN	4	3.25	0.96	108						17
135906	39 INDIA	16	2.38	0.72	82						17
135907	6 BALUCHISTAN	4	3.50	0.58	117						17
135908	6 BALUCHISTAN	8	2.13	0.64	75						17
135909	6 BALUCHISTAN	7	2.14	0.69	73						17
136450	11 CANADA	4	3.50	0.58	100					DEL PAIS	17
136451	11 CANADA	4	2.75	0.50	79					EGYPTIAN	17
136452	11 CANADA	4	3.75	0.50	107						17
136475	57 NEW ZEALAND	4	3.25	0.50	93						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
138617	41 IRAN	4	4.00	0.00	114						17
138618	41 IRAN	4	4.00	0.00	114						17
138620	41 IRAN	4	4.00	0.00	114						17
138621	41 IRAN	3	3.00	0.00	86						17
138622	41 IRAN	4	3.50	0.58	100						17
138624	41 IRAN	3	3.33	0.58	95						17
138625	41 IRAN	4	3.50	0.58	100						17
138627	41 IRAN	4	3.25	0.50	93						17
138628	41 IRAN	20	2.35	0.88	79						17
138629	41 IRAN	4	3.25	0.96	93						17
138630	41 IRAN	4	3.25	0.50	93						17
140050	8 BRAZIL	4	2.75	0.96	79						17
140051	8 BRAZIL	4	2.50	0.58	83						17
140052	8 BRAZIL	4	2.75	0.50	92					REI HUMBERTO	17
140160	2 AFGHANISTAN	4	3.25	0.50	108						17
140403	41 IRAN	35	2.46	0.89	86						17
140404	41 IRAN	8	2.00	0.53	97						17
140405	41 IRAN	8	2.25	0.46	105						17
140406	41 IRAN	4	2.75	0.50	92						17
140407	41 IRAN	8	2.50	0.53	120						17
140408	41 IRAN	4	3.25	0.50	108						17
140409	41 IRAN	4	3.00	0.00	80						17
140410	41 IRAN	4	3.00	0.00	80						17
140411	41 IRAN	4	3.00	0.00	80						17
140412	41 IRAN	4	3.00	0.00	80						17
140413	41 IRAN	16	2.31	0.70	82						17
140414	41 IRAN	4	2.75	0.50	73						17
140415	41 IRAN	4	3.00	0.00	80						17
140416	41 IRAN	4	3.50	0.58	93						17
140417	41 IRAN	4	2.75	0.50	73						17
140418	41 IRAN	4	2.00	1.41	62						17
140419	41 IRAN	8	2.38	0.74	113						17
140420	41 IRAN	4	2.50	0.58	77						17
140421	41 IRAN	4	2.75	0.50	85						17
140422	41 IRAN	4	2.75	0.50	85						17
141273	36 GUATEMALA	13	1.92	1.19	69						17
141963	50 MANCHURIA	6	2.00	0.89	86						17
142697	51 MEXICO	4	2.75	0.50	85						17
142698	51 MEXICO	8	2.50	0.53	117						17
142699	51 MEXICO	4	2.25	0.50	69						17
142700	51 MEXICO	4	3.00	0.00	92						17
142874	41 IRAN	4	2.75	0.50	85						17
142875	41 IRAN	4	3.00	0.00	82						17
142876	41 IRAN	4	2.75	0.50	75						17
142877	41 IRAN	3	3.00	0.00	82						17
142878	41 IRAN	4	2.75	0.50	75						17
142879	41 IRAN	4	3.25	0.96	89						17
142880	41 IRAN	4	2.50	0.58	68						17
142881	41 IRAN	4	3.00	0.00	82						17
142882	41 IRAN	4	3.00	0.00	82						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
143522 63	PERU	8	1.63	0.92	97	10	1.60	1.07	56		12
143523 63	PERU	4	2.50	0.58	83						17
143524 63	PERU	4	2.75	0.50	92	11	0.82	0.60	28		12
143527 63	PERU	8	2.63	1.06	95	4	3.00	0.00	150		12
143679 24	ECUADOR	3	3.00	0.00	100						9
143680 24	ECUADOR	4	2.25	0.50	75	12	0.92	1.08	33		16
144679 41	IRAN	4	3.00	0.00	100						17
144680 41	IRAN	4	3.00	0.00	100						17
144955 63	PERU	4	2.00	0.82	160	7	0.43	0.79	17		12
146083 41	IRAN	4	2.75	0.50	92						17
146084 41	IRAN	4	3.00	0.00	100						17
146085 41	IRAN	4	2.25	0.50	90						17
146086 41	IRAN	4	2.75	0.50	110						17
146087 41	IRAN	4	3.00	0.00	120						17
146088 41	IRAN	3	2.33	0.58	93					TOKYO	17
146089 41	IRAN	3	2.33	0.58	93	4	2.00	0.00	100	EGYPTIAN	16
146090 41	IRAN	8	2.38	0.52	82						17
146091 41	IRAN	4	2.50	0.58	100						17
146092 41	IRAN	4	2.75	0.50	110					YELLOW LEMON	17
146093 41	IRAN	4	3.00	0.00	120					KABOBI	17
146094 41	IRAN	4	2.00	0.82	73					ROUND LEMON	17
146129 8	BRAZIL	12	2.17	1.03	75					PAULISTA	17
147282 75	TASMANIA	4	2.00	0.82	73						17
147609 8	BRAZIL	8	2.63	1.06	86	4	3.00	0.00	120		16
147635 24	ECUADOR	8	2.38	1.06	77	7	1.71	1.11	60		16
148654 41	IRAN	3	2.67	0.58	97						17
148655 41	IRAN	4	2.75	0.50	100						17
148656 41	IRAN	4	3.00	0.00	109						17
148720 8	BRAZIL	4	2.25	0.50	82						17
150782 61	PALESTINE	4	1.75	0.50	78					CANARY EXPORT	17
152043 20	COSTA RICA	12	2.67	1.30	91	3	3.00	1.00	120		16
152266 80	USSR	12	2.67	1.15	92						17
155367 63	PERU	7	1.86	0.69	62						17
155368 63	PERU	4	1.50	1.00	46	4	2.50	0.58	125		16
155369 63	PERU	4	2.00	0.00	62	4	2.00	0.00	100		16
155370 63	PERU	4	2.00	0.82	62						17
155371 63	PERU	8	2.25	0.89	66	7	2.29	0.95	83		16
155372 63	PERU	3	2.00	0.00	62						17
155373 63	PERU	4	1.75	0.50	54						17
155374 63	PERU	4	1.75	0.50	54						17
155375 63	PERU	4	1.75	0.50	54	4	2.50	0.58	125		16
155376 63	PERU	4	1.75	0.50	54						17
155377 63	PERU	12	2.25	0.97	73						17
155378 63	PERU	4	1.50	0.58	50	4	3.00	0.00	100		16
155379 63	PERU	4	1.75	0.50	58	4	3.00	0.00	100		16
157193 4	AUSTRALIA	4	1.75	0.50	58					TATURA DWARF GLOBE	17
157850 61	PALESTINE	12	2.75	1.22	90					MARMANDE	17
157991 44	ITALY	4	2.25	0.50	75					PANCRAZIO	17
157992 44	ITALY	3	2.00	0.00	67					PREZIOSO	17
157993 44	ITALY	4	2.50	0.58	83					PROSPERO	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
158161 81	VENEZUELA	8	2.38	1.30	71	4	2.50	0.58	91		16
158164 81	VENEZUELA	4	2.25	0.50	69	7	2.00	0.82	72		16
158166 81	VENEZUELA	4	2.50	0.58	77	8	2.00	0.76	69		16
158167 81	VENEZUELA	4	3.00	0.00	92	7	1.57	0.98	55		16
158171 81	VENEZUELA	4	3.50	0.58	108	8	2.25	0.71	78		16
158760 15	CHINA	3	2.67	0.58	82					CHIH-MU-TAO-SE	17
159001 63	PERU	4	2.50	0.58	77						17
159002 63	PERU	4	2.50	0.58	77						17
159003 63	PERU	4	3.00	0.00	92						17
159004 63	PERU	4	2.25	0.50	69						17
159005 63	PERU	4	2.75	0.50	92						17
159006 63	PERU	4	1.75	0.50	58						17
159007 63	PERU	4	2.00	0.00	67	8	2.13	0.83	73		16
159008 63	PERU	4	1.75	0.50	58						17
159009 63	PERU	7	2.00	1.00	64						17
159181 63	PERU	4	1.75	0.50	58						17
159193 63	PERU	4	1.75	0.50	58						17
159198 63	PERU	4	2.00	0.82	67					VETOMOLD (121 MASS.)	17
159199 63	PERU	4	1.75	0.50	58					RUTGERS (WOODS NO. 430)	17
162679 3	ARGENTINA	4	2.75	0.50	92					GENOVA	17
163245 39	INDIA	4	2.00	0.82	67						17
163246 39	INDIA	4	2.50	0.58	83	4	2.00	0.00	73		16
163247 39	INDIA	4	2.00	0.00	67						17
163248 39	INDIA	4	3.00	0.00	100						17
163249 39	INDIA	4	2.75	0.50	92						17
163250 39	INDIA	4	3.00	0.00	100						17
163251 39	INDIA	4	3.00	0.00	100						17
163252 39	INDIA	4	1.75	0.50	58						17
163253 39	INDIA	8	2.25	1.16	67						17
163254 39	INDIA	4	2.00	0.00	67						17
163255 39	INDIA	4	2.75	0.50	92						17
164177 39	INDIA	4	2.50	0.58	83						17
164278 39	INDIA	8	2.50	1.20	75						17
164290 39	INDIA	4	2.25	0.50	75						17
164478 39	INDIA	4	2.25	0.50	75						17
164482 39	INDIA	4	2.50	0.58	83						17
164541 39	INDIA	4	2.25	0.96	75						17
164628 39	INDIA	4	2.50	0.58	83						17
164673 39	INDIA	4	2.75	0.50	92						17
164719 39	INDIA	4	3.00	0.00	100						17
164945 77	TURKEY	4	3.00	0.00	100						17
164946 77	TURKEY	3	3.67	0.58	122						17
164947 77	TURKEY	3	4.00	0.00	133						17
165030 77	TURKEY	4	3.00	0.00	100						17
165053 77	TURKEY	4	3.00	0.00	100						17
165489 39	INDIA	4	2.75	0.96	92					PONDEROSA	17
165490 39	INDIA	4	2.75	0.50	85					MARGLOBE	17
166365 39	INDIA	12	2.17	1.40	80	8	2.88	0.35	100		16
166985 77	TURKEY	4	2.75	0.50	85						17
166986 77	TURKEY	4	3.00	0.00	92						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
166989	77 TURKEY	8	2.50	0.76	74						17
166991	77 TURKEY	4	3.25	0.50	100						17
167041	77 TURKEY	4	2.75	0.50	85						17
167054	77 TURKEY	4	3.00	0.82	92						17
167074	77 TURKEY	4	3.50	0.58	108						17
167099	77 TURKEY	4	2.50	0.58	83						17
167103	77 TURKEY	4	2.75	0.50	92						17
167141	77 TURKEY	3	3.00	0.00	100						17
167206	77 TURKEY	4	2.50	0.58	83						17
167329	77 TURKEY	4	3.00	0.00	100						17
169565	77 TURKEY	5	2.40	0.55	76						17
169566	77 TURKEY	4	2.75	0.50	92						17
169567	77 TURKEY	3	2.33	0.58	78						17
169568	77 TURKEY	3	3.00	0.00	100						17
169569	77 TURKEY	3	3.33	0.58	111						17
169570	77 TURKEY	3	3.00	0.00	100						17
169571	77 TURKEY	4	3.50	0.58	117						17
169572	77 TURKEY	4	3.25	0.50	108						17
169573	77 TURKEY	4	2.75	0.50	79						17
169574	77 TURKEY	4	3.75	0.50	125						17
169575	77 TURKEY	4	3.00	0.82	100						17
169576	77 TURKEY	4	3.00	0.82	100						17
169577	77 TURKEY	4	3.00	0.00	100						17
169578	77 TURKEY	4	2.50	1.00	75						17
169579	77 TURKEY	4	2.50	0.58	75						17
169580	77 TURKEY	4	2.50	0.58	75						17
169581	77 TURKEY	3	2.00	1.00	60						17
169582	77 TURKEY	4	2.50	0.58	75						17
169583	77 TURKEY	4	2.75	0.50	82						17
169584	77 TURKEY	4	2.00	0.82	60						17
169585	77 TURKEY	4	3.00	0.00	90						17
169586	77 TURKEY	3	3.33	0.58	100						17
169587	77 TURKEY	4	2.50	0.58	77						17
169588	77 TURKEY	4	3.00	0.82	92						17
169589	77 TURKEY	4	2.00	0.82	62						17
169590	77 TURKEY	6	2.17	0.98	77						17
171708	77 TURKEY	4	3.00	0.00	92						17
171709	77 TURKEY	4	2.75	0.50	85						17
171710	77 TURKEY	3	3.00	0.00	92						17
171711	77 TURKEY	4	3.50	0.58	108						17
171712	77 TURKEY	4	3.50	0.58	108						17
171713	77 TURKEY	4	3.00	0.82	100						17
171714	77 TURKEY	3	3.00	0.00	100						17
171715	77 TURKEY	4	3.75	0.50	125					SIRIK	17
171716	77 TURKEY	3	3.00	0.00	92						17
171717	77 TURKEY	4	3.25	0.50	100						17
171718	77 TURKEY	4	3.00	0.82	92						17
172966	77 TURKEY	4	3.50	0.58	108						17
172967	77 TURKEY	4	2.75	0.50	85						17
172968	77 TURKEY	3	4.00	0.00	123						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
172969	77 TURKEY	3	3.00	1.00	92						17
172970	77 TURKEY	4	2.75	0.50	85						17
172971	77 TURKEY	4	3.00	0.00	92						17
172972	77 TURKEY	4	3.25	0.50	100						17
172973	77 TURKEY	4	2.50	0.58	83						17
172974	77 TURKEY	4	2.75	0.50	92						17
172975	77 TURKEY	4	2.50	0.58	83						17
172976	77 TURKEY	4	2.50	0.58	83						17
172977	77 TURKEY	4	3.00	0.00	100						17
172978	77 TURKEY	4	3.00	0.00	100						17
173725	77 TURKEY	3	3.00	0.00	100						17
173726	77 TURKEY	4	2.50	0.58	83						17
173920	39 INDIA	4	3.00	0.00	100						17
174261	77 TURKEY	4	2.50	1.29	94						17
174262	77 TURKEY	4	2.25	0.96	84						17
174263	77 TURKEY	3	3.00	0.00	113						17
174264	77 TURKEY	4	2.75	1.26	103						17
174265	77 TURKEY	4	2.75	0.50	103						17
174266	77 TURKEY	4	2.75	0.50	103						17
174267	77 TURKEY	4	2.75	0.50	103						17
174268	77 TURKEY	4	3.00	0.00	113						17
174269	77 TURKEY	4	3.25	0.50	122						17
174270	77 TURKEY	3	2.33	1.53	93						17
174879	39 INDIA	4	3.00	0.00	120						17
175774	77 TURKEY	3	3.33	0.58	133						17
175775	77 TURKEY	4	2.50	0.58	100						17
175776	77 TURKEY	4	3.00	0.00	120						17
175777	77 TURKEY	4	3.00	0.00	120						17
175778	77 TURKEY	3	3.33	0.58	133						17
175779	77 TURKEY	3	3.00	0.00	120						17
175780	77 TURKEY	3	2.67	0.58	107						17
175781	77 TURKEY	4	3.00	0.00	120						17
175782	77 TURKEY	4	3.25	0.96	130						17
175783	77 TURKEY	4	2.50	0.58	100						17
175784	77 TURKEY	4	3.00	1.41	120						17
175785	77 TURKEY	4	3.50	0.58	140						17
175786	77 TURKEY	4	4.00	0.00	160						17
176625	77 TURKEY	4	4.00	0.00	160						17
176626	77 TURKEY	4	4.00	0.00	160						17
176627	77 TURKEY	3	3.67	0.58	147						17
176628	77 TURKEY	4	3.00	0.00	100						17
176629	77 TURKEY	4	3.50	0.58	117						17
176630	77 TURKEY	4	2.50	0.58	83						17
176631	77 TURKEY	3	2.33	0.58	78						17
176632	77 TURKEY	4	3.25	0.50	108						17
176634	77 TURKEY	4	2.50	0.58	83						17
176635	77 TURKEY	3	2.33	0.58	78						17
176636	77 TURKEY	3	2.67	0.58	89						17
177006	77 TURKEY	4	3.25	0.50	108						17
177007	77 TURKEY	4	2.00	0.82	67						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
177008	77 TURKEY	3	2.33	1.15	78						17
177009	77 TURKEY	4	2.25	1.26	75						17
177010	77 TURKEY	4	2.50	1.00	83						17
177457	77 TURKEY	3	3.00	0.00	100						17
177458	77 TURKEY	4	4.00	0.00	133						17
177459	77 TURKEY	4	3.00	0.00	100						17
177460	77 TURKEY	4	3.50	0.58	117						17
178978	77 TURKEY	3	3.00	0.00	100						17
178979	77 TURKEY	4	3.50	0.58	105						17
179362	77 TURKEY	4	3.00	0.00	90					TURFAN	17
179363	77 TURKEY	4	3.75	0.50	113						17
179364	77 TURKEY	3	3.33	1.15	100						17
179365	77 TURKEY	4	2.75	0.50	82						17
179366	77 TURKEY	4	2.75	0.50	82						17
179367	42 IRAQ	4	2.75	0.50	82						17
179942	39 INDIA	4	3.00	0.82	90						17
179943	39 INDIA	10	1.90	1.37	76						17
179944	39 INDIA	3	2.00	1.00	67						17
180232	64 PHILIPPINES	3	2.67	0.58	89						17
180233	64 PHILIPPINES	4	2.25	0.50	75						17
180234	64 PHILIPPINES	4	2.25	0.96	75						17
180300	39 INDIA	4	3.50	0.58	117						17
180721	31 GERMANY	12	2.17	0.72	72					IMMUN (BUSCH TOMATE)	17
180722	31 GERMANY	3	4.00	0.00	133					DANISCHE EXPORT	17
180723	31 GERMANY	4	3.50	0.58	117					KONDINE RED	17
180726	31 GERMANY	4	2.75	0.50	92	4	3.00	0.00	100		15
181776	74 SYRIA	4	2.75	0.50	92						17
181777	47 LEBANON	3	3.00	0.00	100						17
181778	47 LEBANON	4	2.25	0.50	75						17
181887	74 SYRIA	4	3.00	0.00	100						17
181888	74 SYRIA	4	2.50	0.58	83					ALEPPO #10	17
181914	74 SYRIA	3	3.00	0.00	100					HAMA NO. 6	17
181951	74 SYRIA	4	2.25	0.50	75					HOMS NO. 11	17
181952	74 SYRIA	6	2.17	0.98	79					HOMS NO. 12	17
182230	77 TURKEY	8	2.38	0.92	79						17
182231	77 TURKEY	8	2.25	0.89	99						17
182232	77 TURKEY	7	2.14	0.90	94						17
182233	77 TURKEY	8	2.00	1.07	93						17
182234	77 TURKEY	7	2.00	1.29	79						17
182235	77 TURKEY	16	2.63	0.81	107						17
182236	77 TURKEY	4	3.50	0.58	200						17
182237	77 TURKEY	4	3.00	0.00	171						17
182973	39 INDIA	4	3.00	0.00	171						17
183326	39 INDIA	4	1.75	1.26	100						17
183327	39 INDIA	4	3.25	0.50	108						17
183560	39 INDIA	8	2.25	1.49	125						17
183692	77 TURKEY	3	3.33	0.58	111					SCARLENTAWEN	17
183693	77 TURKEY	4	2.75	0.50	92					STOKESDALE	17
183932	39 INDIA	4	3.00	0.82	100						17
185684	36 GUATEMALA	3	3.00	0.00	100					ARBOL	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
185685	36 GUATEMALA	4	2.50	1.29	83						17
185686	36 GUATEMALA	15	2.27	0.80	77						17
185688	36 GUATEMALA	4	3.00	0.82	100	4	2.75	0.50	92		16
185689	36 GUATEMALA	4	2.75	0.50	85	7	2.14	1.07	75		16
187002	36 GUATEMALA	4	3.25	0.50	100	8	1.88	0.64	77		16
188565	44 ITALY	4	2.50	0.58	77					PANCRAZIO RAZZA 15	17
188566	44 ITALY	4	3.25	0.50	100					PILASTRO RAZZA 37/22	17
188567	44 ITALY	4	3.50	0.58	108					PROSTERO RAZZA 21	17
188568	44 ITALY	4	4.00	0.00	123					RAZZA 3 P	17
188569	44 ITALY	4	4.00	0.00	123					RAZZA 23/7	17
188570	44 ITALY	3	3.67	0.58	113					RAZZA 28/5	17
188571	44 ITALY	3	4.00	0.00	123					RAZZA 39	17
190188	51 MEXICO	4	2.50	0.58	77	8	1.63	1.06	60		16
190256	55 NEW CALEDONIA	3	2.00	1.00	62	8	2.50	0.53	100		16
190858	3 ARGENTINA	4	4.00	0.00	123					REY DE LOS TEMPRANOS	17
190859	3 ARGENTINA	4	4.00	0.00	123						17
193188	19 COOK ISLANDS	4	2.75	0.50	85						17
193357	4 AUSTRALIA	4	3.00	0.00	92					TATINTER	17
193399	79 USA OHIO	4	3.00	0.82	92					MAC A706	2
193400	79 USA OHIO	4	3.00	0.82	92					MAC A741	2
193401	79 USA OHIO	4	3.75	0.50	115						2
193402	79 USA OHIO	4	3.50	0.58	127					MAC A902	2
193403	79 USA OHIO	4	2.50	0.58	91					MAC A3213	2
193404	79 USA OHIO	4	3.25	0.50	118					LESLEY 597	2
193405	79 USA OHIO	4	2.50	0.58	91					LESLEY 698	2
193407	79 USA OHIO	4	3.50	0.58	127					LESLEY 1040	2
193408	79 USA OHIO	4	3.75	0.50	136	11	0.18	0.40	6		3
193409	79 USA OHIO	4	3.50	0.58	127					LIND 2391-2	2
193410	79 USA OHIO	4	3.00	0.00	109					LIND 2392-2	2
193411	79 USA OHIO	4	3.25	0.50	118					LIND 2393-5	2
193412	79 USA OHIO	4	4.00	0.00	100					LIND 2394-2	2
193414	79 USA OHIO	3	4.00	0.00	100					LESLEY'S 4N-T160D	3
193415	79 USA OHIO	3	4.00	0.00	100					PENNORANGE E 160 A	17
193416	79 USA TEXAS	4	3.75	0.50	94						2
193417	79 USA TEXAS	4	4.00	0.00	100						2
193418	79 USA TEXAS	3	4.00	0.00	100						2
193419	79 USA TEXAS	4	4.00	0.00	100						2
193420	79 USA TEXAS	4	3.50	0.58	88						2
193421	79 USA TEXAS	4	3.75	0.50	94						2
193555	28 ETHIOPIA	4	3.50	0.58	108					BONNIE BEST	17
193556	28 ETHIOPIA	6	2.50	0.84	86					PARADEISER	17
193557	28 ETHIOPIA	4	2.75	0.50	85						18
194002	28 ETHIOPIA	8	2.25	0.46	81						17
194060	29 FRANCE	3	2.67	0.58	82					MARMANDE	17
194061	29 FRANCE	4	3.25	0.50	100					MERVEILLE DES MARCHES	17
194128	19 COOK ISLANDS	4	3.25	0.50	100						17
194307	28 ETHIOPIA	8	2.25	0.89	82						17
194308	28 ETHIOPIA	8	2.25	1.67	108						17
194561	3 ARGENTINA	14	2.29	0.91	83					MORMAN 50 DAY	17
194883	79 USA NEW YORK	8	2.13	0.83	79					PINK CLUSTER	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
194884	3 ARGENTINA	4	2.25	0.96	75						17
195001	28 ETHIOPIA	4	3.50	0.58	117						17
195002	28 ETHIOPIA	8	1.63	1.19	92						17
195003	28 ETHIOPIA	4	3.50	0.58	117	8	2.38	0.74	100		16
195004	28 ETHIOPIA	4	3.50	0.58	117						17
195005	28 ETHIOPIA	3	3.67	0.58	122						17
195006	28 ETHIOPIA	12	2.17	1.47	71	10	2.70	0.95	89		16
195322	36 GUATEMALA	8	2.00	0.76	62	7	2.29	0.95	79		16
195323	36 GUATEMALA	4	2.75	0.50	85						17
195324	36 GUATEMALA	4	3.00	0.00	92	8	2.75	0.71	106		16
195325	36 GUATEMALA	4	3.50	0.58	108	5	2.60	1.52	113		16
195615	28 ETHIOPIA	4	2.00	0.00	62						17
195616	28 ETHIOPIA	8	1.88	1.13	92						17
195777	36 GUATEMALA	3	3.00	0.00	92						17
195778	36 GUATEMALA	4	3.50	0.58	108						17
195779	36 GUATEMALA	1	3.00	0.00	92						17
195780	36 GUATEMALA	8	2.13	0.99	75						17
195781	36 GUATEMALA	4	2.50	0.58	83	8	2.38	1.06	90		16
195782	36 GUATEMALA	4	3.00	0.00	100						17
195783	36 GUATEMALA	4	2.50	0.58	83						17
195784	36 GUATEMALA	4	1.50	0.58	50						17
195785	36 GUATEMALA	8	1.75	0.71	62						17
195786	36 GUATEMALA	4	2.25	0.96	75						17
195787	36 GUATEMALA	3	2.67	0.58	89						17
195788	36 GUATEMALA	4	3.00	0.00	100	8	2.00	1.07	71		16
195789	36 GUATEMALA	3	2.67	0.58	97	7	2.29	0.95	79		16
195790	36 GUATEMALA	4	3.00	0.00	82	8	2.13	0.64	68		16
195791	36 GUATEMALA	4	3.50	0.58	95	8	2.50	0.53	89		16
196004	28 ETHIOPIA	8	2.25	1.49	98						17
196005	28 ETHIOPIA	4	3.25	0.50	89						17
196297	58 NICARAGUA	4	3.00	0.00	82						17
196298	58 NICARAGUA	4	3.00	0.00	82						17
196481	8 BRAZIL	4	3.75	0.50	102						17
196868	28 ETHIOPIA	4	3.00	0.00	82						17
197159	36 GUATEMALA	4	3.00	0.00	100	8	2.50	0.53	89		16
198674	51 MEXICO	3	3.00	0.00	100	8	2.00	0.53	71		16
198912	8 BRAZIL	4	3.00	0.82	100	8	2.50	0.53	90		16
199016	79 USA OKLAHOMA	3	3.00	0.00	100					JUAN PERON	17
199017	79 USA OKLAHOMA	4	3.00	0.00	100					PLAINS TREE	17
199018	79 USA OKLAHOMA	3	2.67	1.53	89					SOONER	17
199236	79 USA FLORIDA	4	4.00	0.00	133					COOPER'S SPECIAL	17
199237	27 ENGLAND	4	3.50	0.58	117					STERLING CASTLE	17
199380	63 PERU	4	3.00	0.00	100	4	0.75	0.96	33		6
199742	11 CANADA	4	2.50	0.58	94						17
200879	2 AFGHANISTAN	3	2.00	0.00	75						17
200880	2 AFGHANISTAN	4	3.00	0.00	113						17
201266	51 MEXICO	4	3.00	0.00	113						17
201267	51 MEXICO	4	3.50	0.58	131						17
201476	51 MEXICO	4	3.00	0.00	113						17
201773	11 CANADA	4	3.00	0.00	113	3	2.67	0.58	97	EARLINORTH	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
201774 79	USA OKLAHOMA	4	3.25	0.50	118	4	3.00	0.00	109	HARDIN JOINTLESS #70	17
201775 66	PUERTO RICO	4	3.25	0.50	122					PETRILLO	17
203229 4	AUSTRALIA	4	3.00	0.00	86					MANZANA	17
203230 4	AUSTRALIA	4	3.25	0.50	93					REY DE LOS TEMPRANOS	17
203231 4	AUSTRALIA	3	2.67	0.58	76						17
203232 69	SOUTH AFRICA	12	1.75	1.22	54	4	3.00	0.00	109	WHEATLEY'S FROST RESISTANT	17
204587 77	TURKEY	4	3.50	0.58	100	8	2.38	0.74	85		16
204711 77	TURKEY	1	4.00	0.00	114						17
204712 77	TURKEY	4	3.50	0.58	100						17
204713 77	TURKEY	4	3.00	0.82	86						17
204972 79	USA WEST VIRGINIA	4	2.50	0.58	71						17
204973 79	USA WEST VIRGINIA	4	3.75	0.50	100						17
204974 79	USA WEST VIRGINIA	3	3.67	0.58	98						17
204975 79	USA WEST VIRGINIA	4	3.75	0.50	100	8	2.50	0.53	90		16
204976 79	USA WEST VIRGINIA	4	3.25	0.50	87	8	2.75	0.89	92		16
204977 79	USA WEST VIRGINIA	4	3.00	0.00	80						17
204978 79	USA WEST VIRGINIA	4	3.00	0.00	80	8	2.63	0.52	125		16
204979 79	USA WEST VIRGINIA	3	3.67	0.58	98						17
204980 79	USA WEST VIRGINIA	4	3.50	0.58	93	8	2.38	1.06	104		16
204981 79	USA WEST VIRGINIA	4	3.00	0.00	80	8	2.00	0.53	103		16
204982 79	USA WEST VIRGINIA	4	3.25	0.50	81	8	2.13	0.35	115		16
204983 79	USA WEST VIRGINIA	4	3.25	0.50	81						17
204984 79	USA WEST VIRGINIA	4	3.50	0.58	88						17
204985 79	USA WEST VIRGINIA	4	3.50	0.58	88						17
204986 79	USA WEST VIRGINIA	4	2.75	0.50	69						17
204987 79	USA WEST VIRGINIA	7	2.29	0.49	71	8	2.25	0.89	110		16
204988 79	USA WEST VIRGINIA	3	3.00	0.00	75						17
204989 79	USA WEST VIRGINIA	4	3.00	0.00	75						17
204990 79	USA WEST VIRGINIA	4	3.50	0.58	88						17
204991 79	USA WEST VIRGINIA	4	3.00	0.00	86						17
204992 79	USA WEST VIRGINIA	4	3.00	0.00	86	8	2.13	0.99	102		16
204993 79	USA WEST VIRGINIA	4	3.00	0.00	86						17
204994 79	USA WEST VIRGINIA	4	3.00	0.00	86						17
204995 79	USA WEST VIRGINIA	4	3.25	0.50	93						17
204996 79	USA WEST VIRGINIA	2	3.50	0.71	100	8	2.00	1.07	93		16
204997 79	USA WEST VIRGINIA	4	3.00	0.00	86	8	2.38	0.52	125		16
204998 79	USA WEST VIRGINIA	4	3.25	0.50	93	8	3.00	0.00	127		16
204999 79	USA WEST VIRGINIA	4	3.50	0.58	100	7	2.00	0.82	87	STONE	16
205000 79	USA WEST VIRGINIA	4	3.25	0.50	93					BONNIE BEST X WILD	17
205001 79	USA WEST VIRGINIA	4	3.00	0.82	86	8	2.50	0.53	96		16
205002 79	USA WEST VIRGINIA	4	3.00	0.82	86	8	2.63	0.52	101	MONTMOSA PONDEROSA X WILD	14
205003 79	USA WEST VIRGINIA	4	2.75	0.50	79					WILD X PRINCESS OF WALES	17
205004 79	USA WEST VIRGINIA	4	3.50	0.58	100					MARGLOBE X WILD	17
205005 79	USA WEST VIRGINIA	7	2.29	0.49	75					BONNIE BEST X WILD	17
205006 79	USA WEST VIRGINIA	4	3.00	0.00	86					REDFIELD BEAUTY X WILD	17
205007 79	USA WEST VIRGINIA	4	2.50	0.58	71						17
205008 79	USA WEST VIRGINIA	4	3.00	0.00	86						17
205009 79	USA WEST VIRGINIA	3	2.67	0.58	76	8	1.63	1.06	71		12
205010 79	USA WEST VIRGINIA	4	3.25	0.50	93	8	1.75	0.89	69		16
205011 79	USA WEST VIRGINIA	4	3.25	0.50	93	8	1.38	1.30	57		16

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
205012	79 USA WEST VIRGINIA	4	3.00	0.00	86	8	0.00	0.00	0		12
205013	79 USA WEST VIRGINIA	4	3.25	0.50	93	7	2.86	0.69	111		16
205014	79 USA WEST VIRGINIA	3	3.00	0.00	86	8	1.75	1.49	65		16
205015	79 USA WEST VIRGINIA	4	3.25	0.50	93	7	2.43	0.53	84		16
205016	79 USA WEST VIRGINIA	4	2.75	0.50	79	7	2.57	0.53	90		16
205017	79 USA WEST VIRGINIA	4	2.75	0.50	79	8	1.75	0.89	64		16
205018	79 USA WEST VIRGINIA	4	3.50	0.58	100	8	0.00	0.00	0		16
205019	79 USA WEST VIRGINIA	4	3.00	0.00	86	7	1.57	0.79	55		16
205020	79 USA WEST VIRGINIA	4	3.00	0.00	86	8	1.50	1.07	55		16
205021	79 USA WEST VIRGINIA	3	3.33	0.58	95	5	2.20	0.84	76		16
205022	79 USA WEST VIRGINIA	4	3.25	0.50	93	8	2.00	0.53	73		16
205023	79 USA WEST VIRGINIA	4	3.00	0.00	86						17
205024	79 USA WEST VIRGINIA	4	3.00	0.00	86						17
205025	79 USA WEST VIRGINIA	3	3.00	0.00	86						17
205026	79 USA WEST VIRGINIA	3	3.33	0.58	95	4	2.50	0.58	91		16
205027	79 USA WEST VIRGINIA	4	3.00	0.00	82						17
205028	79 USA WEST VIRGINIA	2	2.50	0.71	68						17
205029	79 USA WEST VIRGINIA	4	3.25	0.50	89						17
205030	79 USA WEST VIRGINIA	3	3.00	0.00	82						17
205031	79 USA WEST VIRGINIA	3	2.67	0.58	73						17
205032	79 USA WEST VIRGINIA	2	3.00	0.00	82						17
205033	79 USA WEST VIRGINIA	3	3.00	0.00	82	3	2.00	0.00	73		16
205034	79 USA WEST VIRGINIA	4	3.25	0.50	89						17
205035	79 USA OHIO	7	2.43	0.53	73						2
205036	79 USA OHIO	4	3.25	0.50	100						2
205037	79 USA OHIO	6	2.50	0.55	81					LINDSTROM 2074-3-M	2
205038	79 USA OHIO	5	2.60	0.55	86					LINDSTROM 2217-1-2	2
205039	79 USA OHIO	2	3.00	0.00	92					T. M. CURRENCE FS-5-12	2
205040	79 USA OHIO	3	3.00	0.00	92					YELLOW PEACH FS-3	17
205041	79 USA TEXAS	2	3.00	0.00	92						2
205042	79 USA TEXAS	3	2.67	0.58	82						2
205043	79 USA TEXAS	10	2.60	1.51	69						2
205044	79 USA TEXAS	4	3.00	0.00	92						2
205045	79 USA TEXAS	4	3.25	0.50	108						2
205046	79 USA TEXAS	7	2.14	0.38	72						2
205196	77 TURKEY	3	2.67	0.58	89						17
205336	23 EAST AFRICA	4	3.25	0.50	108						17
205481	20 COSTA RICA	3	3.00	0.00	100						17
205641	44 ITALY	4	2.75	0.50	92					GENOVESE	17
205642	44 ITALY	4	3.00	0.00	100					LADINO DI PANNOCCHIA	17
206000	72 SWEDEN	3	3.00	0.00	100					BONITA OJO/50	17
206151	39 INDIA	4	3.50	0.58	117					PAVILI	17
206449	77 TURKEY	4	2.75	0.50	79						17
206450	77 TURKEY	4	3.00	0.00	86						17
206967	77 TURKEY	4	2.75	0.50	79						17
206968	77 TURKEY	4	3.00	0.82	86						17
208760	21 CUBA	4	3.25	0.50	93						17
208835	21 CUBA	4	3.00	0.00	86					MARTI 51	17
208836	21 CUBA	4	3.00	0.00	86					CRESTO M51 X 64	17
208837	21 CUBA	2	3.00	0.00	86					CUETO M51 X 62	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
208838	21 CUBA	2	3.00	0.00	86					CUETO M51 X 65	17
209048	66 PUERTO RICO	4	3.00	0.00	90						17
209974	66 PUERTO RICO	4	3.00	0.00	90					PERON	17
209975	7 BOLIVIA	4	3.00	0.00	90	3	2.33	0.58	85	REDONDO	16
209976	7 BOLIVIA	4	3.00	0.00	90					RINON	17
209977	7 BOLIVIA	4	2.50	0.58	75					CHULUMANI	17
211838	63 PERU	3	2.33	0.58	70	8	0.63	0.74	23		12
211839	63 PERU	3	2.67	0.58	80	8	1.50	1.31	56		12
211840	63 PERU	4	2.75	0.50	82	8	0.38	0.52	13		12
212017	41 IRAN	4	3.00	0.00	90						17
212018	41 IRAN	4	2.50	0.58	83						17
212062	20 COSTA RICA	4	3.00	0.00	100					TURRIALBA	17
212103	2 AFGHANISTAN	9	2.56	1.24	70						17
212407	63 PERU	6	2.50	1.22	83						9
212408	63 PERU	10	2.00	1.05	56	8	0.00	0.00	0		12
212409	81 VENEZUELA	4	2.25	0.50	75	8	0.00	0.00	0	DE ZERPA 52-118	12
212410	81 VENEZUELA	3	3.00	0.00	100	4	2.25	0.50	82	DE ZERPA	16
212411	52 MOROCCO	4	3.00	0.00	100	4	2.00	0.00	73	BURDICK-038	16
212412	79 USA NORTH DAKOTA	4	3.00	0.00	100					CAVALIER	17
212413	79 USA NORTH DAKOTA	3	3.67	0.58	122					DOUBLERICH	17
212414	79 USA NEW JERSEY	4	3.00	0.00	100					CAMPBELL SOUP 119	17
212415	79 USA NEW JERSEY	4	3.00	0.00	100					CAMPBELL SOUP 54	17
212416	79 USA CALIFORNIA	4	3.00	0.00	100						5
212417	79 USA CALIFORNIA	4	2.50	0.58	83						5
212418	79 USA CALIFORNIA	4	2.50	0.58	83						5
212419	79 USA CALIFORNIA	4	2.50	0.58	83						5
212420	79 USA CALIFORNIA	3	2.67	0.58	89						5
212421	79 USA CALIFORNIA	4	3.00	0.00	100						5
212422	79 USA CALIFORNIA	8	2.00	0.76	121						5
212423	79 USA CALIFORNIA	7	1.57	0.79	90						5
212424	79 USA CALIFORNIA	7	1.86	0.90	118						5
212425	79 USA OHIO	8	2.25	0.71	137						2
212426	79 USA TEXAS	9	2.22	1.30	93						2
212428	79 USA OHIO	4	1.75	0.50	117						2
212429	79 USA OHIO	4	1.75	0.96	117						2
212430	79 USA CALIFORNIA	3	1.67	1.15	111						2
212431	79 USA OHIO	4	1.75	0.50	117						2
212432	79 USA OHIO	8	1.75	1.04	121						2
212433	79 USA OHIO	8	2.00	0.93	141						2
212434	79 USA OHIO	8	1.75	0.71	127					STOKESDALE	3
212435	79 USA OHIO	8	2.25	0.46	171					STOKESDALE	3
212437	79 USA OHIO	8	1.75	0.89	100					BREAK O'DAY	3
212438	79 USA CALIFORNIA	8	1.63	0.92	95						4
212439	79 USA CALIFORNIA	8	1.38	1.19	70						3
212440	79 USA CALIFORNIA	8	2.00	0.93	117						3
212441	79 USA OHIO	5	1.60	0.55	108						3
212442	79 USA OHIO	4	2.50	0.58	83						4
212443	79 USA OHIO	4	2.50	0.58	83						4
212444	79 USA OHIO	4	2.50	0.58	83						4
213186	34 GREECE	4	2.75	0.50	92						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
213187	34 GREECE	4	2.00	0.82	67						17
213188	34 GREECE	3	2.33	0.58	78						17
213189	34 GREECE	4	2.25	0.96	75						17
215709	63 PERU	4	2.00	0.82	67						17
215756	63 PERU	7	1.57	0.79	57						17
215757	63 PERU	4	1.75	1.26	88						17
215758	63 PERU	4	2.50	0.58	125						17
220290	2 AFGHANISTAN	4	2.25	0.96	113						17
220718	27 ENGLAND	3	3.00	0.00	150						17
220863	11 CANADA	7	1.57	0.79	65					BESTAL	17
220864	27 ENGLAND	3	1.67	0.58	83					ENGLISH SUTTON	17
220865	79 USA SOUTH CAROLINA	3	2.33	0.58	117					TARGINNIE RED	17
222256	41 IRAN	4	1.50	0.58	75	3	2.00	1.00	73		16
223305	79 USA RHODE ISLAND	4	2.25	0.96	113					DEVON'S SURPRISE X MARGLOBE	17
223306	79 USA RHODE ISLAND	3	3.00	0.00	109						17
223307	79 USA RHODE ISLAND	3	2.67	0.58	97					CAMPBELL SOUP 222	17
223308	79 USA RHODE ISLAND	3	2.67	0.58	97					BURGESS CRACK PROOF	17
223309	79 USA RHODE ISLAND	4	3.00	0.00	109	3	2.33	0.58	85	PEARSON'S P 723	16
223310	79 USA RHODE ISLAND	3	2.67	0.58	97					P. 723 X VALIANT	17
223311	79 USA RHODE ISLAND	2	3.50	0.71	127					P. 723 X VALIANT	17
223312	79 USA RHODE ISLAND	2	2.50	0.71	91					CS 222 X JOHN BAER	17
223313	79 USA RHODE ISLAND	4	3.00	0.00	109						17
223314	79 USA RHODE ISLAND	4	3.50	0.58	127						17
223315	79 USA RHODE ISLAND	4	3.25	0.50	122						17
223316	79 USA RHODE ISLAND	4	3.75	0.50	141						17
223843	64 PHILIPPINES	4	2.75	0.96	103						17
224572	79 USA CALIFORNIA	3	2.00	0.00	77						2
224573	79 USA CALIFORNIA	7	1.57	0.53	60						2
224574	79 USA OHIO	4	2.00	0.82	75						2
224575	79 USA OHIO	5	1.80	0.84	68						2
224576	79 USA OHIO	3	2.67	0.58	100						2
224577	79 USA OHIO	4	1.75	0.96	66						2
224578	79 USA TEXAS	4	2.75	0.50	92						2
224579	79 USA OHIO	3	3.00	0.00	100						2
224580	79 USA OHIO	4	3.25	0.50	108						3
224582	79 USA OHIO	4	2.25	0.96	75						3
224585	79 USA OHIO	3	3.33	0.58	111						3
224586	79 USA OHIO	3	3.33	0.58	111						3
224587	79 USA OHIO	3	3.33	0.58	111						3
224588	79 USA OHIO	2	3.50	0.71	117						3
224589	79 USA OHIO	2	3.50	0.71	108	3	2.33	0.58	85		15
224590	79 USA CALIFORNIA	4	2.75	0.50	85						5
224591	79 USA CALIFORNIA	4	3.00	0.00	92						5
224592	79 USA CALIFORNIA	3	3.00	1.00	92						5
224593	79 USA CALIFORNIA	7	2.14	0.90	83						5
224594	79 USA CALIFORNIA	8	1.75	0.46	63						5
224595	79 USA CALIFORNIA	4	1.75	0.96	54						5
224596	79 USA OHIO	3	1.67	2.08	51						5
224597	79 USA OHIO	4	2.25	1.26	69						5
224673	78 URUGUAY	3	2.33	0.58	85					MIKADO	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
224674	79 USA NEW HAMPSHIRE	2	2.50	0.71	91						17
224675	51 MEXICO	3	2.67	0.58	97						16
224709	51 MEXICO	3	2.67	0.58	97	8	0.75	0.89	31		12
224710	51 MEXICO	3	2.67	0.58	97	5	2.20	0.45	95		12
226516	41 IRAN	3	2.00	0.00	73						17
226644	41 IRAN	4	3.50	0.58	127						17
227304	41 IRAN	4	2.75	0.50	100						17
229809	79 USA NEW HAMPSHIRE	3	3.00	0.00	109						17
229810	79 USA NEW HAMPSHIRE	5	2.40	0.55	79						17
230327	24 ECUADOR	4	3.00	0.00	86	8	1.50	0.53	68		12
231058	7 BOLIVIA	8	2.25	0.89	71					REY HUMBERTO	17
231729	79 USA HAWAII	4	3.00	0.00	86						17
231730	79 USA HAWAII	3	1.67	0.58	48						17
233930	24 ECUADOR	4	2.25	0.96	64	4	0.25	0.50	9		16
234254	79 USA MICHIGAN	3	2.33	1.15	67					GOLD BALL	17
234255	11 CANADA	3	2.00	1.00	57						17
234625	4 AUSTRALIA	4	2.50	0.58	71					GROSSE LISSE	17
234626	4 AUSTRALIA	3	3.00	0.00	133					GROSSE LISSE	17
234627	4 AUSTRALIA	3	2.67	0.58	119					TATURA DWARF GLOBE	17
234628	69 SOUTH AFRICA	4	2.75	0.50	122					SAN MARZANO	17
235673	79 USA NEW YORK	3	2.33	0.58	104						17
237131	44 ITALY	4	3.00	0.00	133					FICARAZZI	17
237132	44 ITALY	4	2.75	0.50	122					GENOVESE	17
237133	44 ITALY	4	2.50	0.58	111					LADINO DI PANNOCCHIA	17
237134	44 ITALY	3	2.67	0.58	119					NOSTRANO GROSSO	17
237135	44 ITALY	4	1.75	0.50	78					PERDRIGEON	17
237136	44 ITALY	3	3.67	0.58	138					PIERRETTE	17
237137	44 ITALY	4	2.25	0.96	84					SAN MARZANO	17
237640	79 USA CALIFORNIA	4	2.25	0.50	84	4	3.00	0.00	100		16
241592	17 CHINA, TAIWAN	4	3.50	0.58	131						17
244672	39 INDIA	4	1.75	0.96	66						17
244956	20 COSTA RICA	4	1.75	0.50	66						17
244957	20 COSTA RICA	8	1.88	0.83	73						17
245760	79 USA RHODE ISLAND	3	2.33	0.58	88						17
246585	63 PERU	4	2.25	0.96	84						9
246586	63 PERU	3	2.67	0.58	107						9
246994	34 GREECE	4	2.50	0.58	100						17
247087	24 ECUADOR	2	3.00	0.00	120						9
247089	4 AUSTRALIA	4	2.25	0.96	90					KYI	17
247528	76 THAILAND	8	2.13	0.83	85						17
248504	27 ENGLAND	4	2.25	0.96	90					VICTORY	17
248741	18 COLOMBIA	2	2.00	0.00	80						17
249567	76 THAILAND	4	2.75	0.50	110						17
249641	39 INDIA	4	2.75	0.50	110	4	3.00	0.00	100	PUSA RED PLUM	16
250123	54 NETHERLANDS	7	1.86	0.69	84					ANAIT	17
250124	54 NETHERLANDS	3	2.33	1.15	117					OKTJABRENOK	17
250431	22 CZECHOSLOVAKIA	4	2.50	0.58	125					CONDINE RED	17
250432	22 CZECHOSLOVAKIA	3	3.00	0.00	150					OLOMOUCKE	17
250433	22 CZECHOSLOVAKIA	4	2.50	0.58	125					OLOMOUCKE NIZKE	17
250434	22 CZECHOSLOVAKIA	3	3.67	0.58	183					OSTRAVSKE RANE	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
250435 22	CZECHOSLOVAKIA	4	2.75	0.50	138					PRUHONICKY UNIVERSAL	17
250436 22	CZECHOSLOVAKIA	3	3.00	0.00	150					STUPICKE	17
250437 22	CZECHOSLOVAKIA	4	3.00	0.00	150					STUPIEKE RANE	17
251296 63	PERU	4	3.00	0.00	113	4	2.00	0.00	67		16
251297 24	ECUADOR	4	3.00	0.00	113						17
251298 63	PERU	4	3.00	0.00	113						17
251299 24	ECUADOR	3	2.33	0.58	88	3	0.67	1.15	22		16
251300 24	ECUADOR	3	3.00	0.00	113	3	2.00	0.00	67		16
251301 63	PERU	6	2.33	1.86	58						6
251302 63	PERU	2	3.00	0.00	171	2	2.00	0.00	80		6
251304 24	ECUADOR	3	2.33	1.15	88	4	0.00	0.00	0		8
251306 63	PERU	8	2.38	0.74	144						9
251307 63	PERU	4	2.75	0.50	103						9
251308 63	PERU	4	3.00	0.00	100						9
251309 63	PERU	4	3.50	0.58	117						9
251310 63	PERU	4	2.00	0.82	67						9
251311 63	PERU	4	2.50	0.58	83						9
251314 63	PERU	2	3.00	0.00	100						9
251315 63	PERU	3	3.33	0.58	111	3	1.33	1.15	76		12
251316 63	PERU	4	3.00	0.00	100	4	0.25	0.50	14		12
251317 63	PERU	4	3.25	0.50	100	7	0.57	0.53	17		12
251318 3	ARGENTINA					4	0.00	0.00	0		12
251319 24	ECUADOR	4	3.50	0.58	108	8	1.50	0.53	63		12
251320 24	ECUADOR	4	3.25	0.50	100	8	1.88	0.64	81		12
251321 24	ECUADOR	4	3.00	0.00	92	8	1.75	0.46	73		12
251322 24	ECUADOR	3	3.00	0.00	92	3	0.00	0.00	0		16
251323 24	ECUADOR	4	3.00	0.00	92	3	1.33	1.15	44		16
251626 83	YUGOSLAVIA	4	3.00	0.00	92						17
254644 79	USA OHIO	4	2.50	0.58	77						2
254645 79	USA CALIFORNIA	2	2.50	0.71	91						2
254646 79	USA CALIFORNIA	4	2.25	0.50	82						2
254647 79	USA CALIFORNIA	4	3.25	0.50	118						2
254648 79	USA OHIO	3	3.00	0.00	109						2
254649 79	USA OHIO	3	3.00	0.00	109					GLECKLER GOLD GLOW	2
254650 79	USA OHIO	3	3.00	0.00	109						2
254651 79	USA OHIO	2	3.00	0.00	109						2
254652 79	USA OHIO	4	2.50	0.58	91					GLECKLER EVERGREEN	2
254653 79	USA OHIO	3	3.00	0.00	109						2
254656 79	USA OHIO	4	3.25	0.50	217						2
254657 79	USA OHIO	11	2.18	0.75	105						2
254658 79	USA TEXAS	3	2.33	1.15	156						2
254659 79	USA OHIO	7	1.86	0.69	113						2
254661 79	USA OHIO	3	2.33	0.58	133					OHIO W-R GLOBE	3
254662 79	USA OHIO	3	3.00	0.00	200						5
254663 79	USA OHIO	2	3.50	0.71	233						5
254664 79	USA OHIO	1	4.00	0.00	267						5
254665 79	USA OHIO	4	2.00	0.00	133					JOHN BAER	5
255829 44	ITALY	3	2.00	1.00	89					BARESE O "A PRUNO"	17
255830 44	ITALY	3	2.67	0.58	119					LAMPADINA	17
255831 44	ITALY	4	2.25	0.50	100					PANERAZIO	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
255832	44 ITALY	3	2.67	0.58	119					PAULLO	17
255833	44 ITALY	3	2.67	0.58	119					PIGMEO	17
255834	44 ITALY	2	3.00	0.00	133					PILASTRO	17
255835	44 ITALY	3	2.00	0.00	89					PIRRO	17
255836	44 ITALY	4	2.50	0.58	111					PREZIOSO	17
255837	44 ITALY	3	3.00	0.00	133					PROSPERO 21	17
255838	44 ITALY	2	2.50	0.71	91					PROSPERO 39	17
255839	44 ITALY	4	2.25	0.50	82					SAN MARZANO	17
255840	44 ITALY	3	3.00	0.00	109					VESUVIO	17
255841	44 ITALY	4	2.00	0.82	73					RUTGERS X LAMPADINA	17
255842	44 ITALY	4	2.25	0.96	82					LAMPADINA X N.D. A. C. 38	17
255843	44 ITALY	3	2.67	0.58	97					LINE 3700-3 X PONDEROS	17
255844	44 ITALY	4	2.25	0.50	82					LAMPADINA X N.D. A. C. 38	17
255845	44 ITALY	3	2.67	0.58	97					CAMPIONE X LAMPADINA	17
255846	44 ITALY	4	2.50	0.58	91					N.D.A.C. 38 X LAMPADINA	17
255847	44 ITALY	4	3.00	0.00	120					N.D.A.C. 38 X LAMPADINA	17
255848	44 ITALY	4	2.75	0.50	110					N.D.A.C. 38 X LAMPADINA	17
255849	44 ITALY	4	3.25	0.50	130					N.D.A.C. 38 X LAMPADINA	17
255850	44 ITALY	4	3.00	0.00	120					LINE 370-3 X LAMPADINA	17
255851	44 ITALY	4	2.75	0.50	110					LINE 370-3 X LAMPADINA	17
255852	44 ITALY	3	2.67	0.58	107					LINE 276 X PAULLO	17
255853	44 ITALY	3	2.00	0.00	80					LINE 275 X LAMPADINA	17
255854	44 ITALY	4	2.50	0.58	100					LINE 275 X LAMPADINA	17
255855	44 ITALY	3	2.33	0.58	93					LINE 370-3 X LAMPADINA	17
255856	44 ITALY	7	1.86	0.90	182					LINE 370-3 X LAMPADINA	17
255857	44 ITALY	11	1.91	0.94	112					LINE 370-3 X LAMPADINA	17
255858	44 ITALY	12	1.58	1.16	82					LINE 3700-3 X PONDEROS	17
255859	44 ITALY	7	1.00	1.15	119						17
255860	44 ITALY	2	2.50	0.71	375						17
255861	44 ITALY	3	2.67	0.58	400					SAN MARZANO X (15 X 21) NO. 2	17
255862	44 ITALY	4	2.25	0.50	338					BLOOD ORANGE X CUOR DI BUE	17
255863	44 ITALY	11	1.91	1.04	150						17
255864	44 ITALY	7	1.86	0.90	227					PALLA D'ORO X CUOR DE BUE	17
255865	44 ITALY	3	3.00	0.00	120					PONDEROSA X CUOR DI BUE	17
255866	44 ITALY	2	3.00	0.00	120					SAN MARZANO X CUOR DI BUE	17
255867	44 ITALY	3	2.67	0.58	107					TANGERINE X CUOR DI BUE	17
255868	44 ITALY	4	1.25	0.96	110					LINE 276 X PAULLO	17
255955	3 ARGENTINA	4	2.00	0.82	80						17
256259	79 USA CALIFORNIA	10	2.00	0.94	97						17
256260	79 USA CALIFORNIA	2	2.50	0.71	100						5
256261	79 USA CALIFORNIA	7	1.57	0.79	120						5
257290	71 SPAIN	7	1.43	0.98	107					MURCIANO	17
257484	79 USA OHIO	3	2.67	0.58	107					HEINZ 302	17
257488	50 MANCHURIA	4	1.75	0.50	70						17
257503	80 USSR	4	2.00	0.82	80					AURORA	17
258469	14 CHILE	8	1.88	0.83	65						17
258470	14 CHILE	4	2.25	0.50	90						17
258471	14 CHILE	8	2.25	0.89	76						17
258472	18 COLOMBIA	8	2.25	0.89	76						17
258473	24 ECUADOR	3	2.00	1.00	80						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
258474	24 ECUADOR	4	2.00	0.00	80						17
258475	24 ECUADOR	4	1.75	0.50	70						17
258476	24 ECUADOR	4	2.25	0.96	90						17
258477	63 PERU	4	2.75	0.50	110						17
258478	63 PERU	3	2.00	0.00	80						17
258479	63 PERU	4	2.25	0.50	90						17
258480	63 PERU	3	2.00	1.00	80						17
258481	63 PERU	4	1.75	0.96	70						17
258482	63 PERU	4	2.50	1.00	100						17
258483	63 PERU	3	3.00	1.73	120						17
258484	63 PERU	2	2.00	0.00	73						17
258485	63 PERU	4	2.25	0.50	82						17
258486	63 PERU	4	2.50	0.58	91						17
258487	63 PERU	4	3.50	0.58	127						17
258488	63 PERU	4	2.50	0.58	91						17
258808	67 ROMANIA	3	2.67	0.58	97					AURORA	17
258809	67 ROMANIA	4	3.00	0.00	109					DE TIGANESTI	17
258810	67 ROMANIA	4	3.00	0.82	109					LINIA 71	17
258811	67 ROMANIA	3	2.67	0.58	97					MASTER CARNOSA	17
258812	67 ROMANIA	2	3.00	0.00	100					SELECTIUNEA FALTICENI	17
260394	8 BRAZIL	4	2.75	0.50	92						17
260395	3 ARGENTINA	3	3.00	1.00	100					MAGNIT POTENTE	17
260396	7 BOLIVIA	3	2.67	0.58	89						17
260397	7 BOLIVIA	2	3.50	0.71	117						17
260398	7 BOLIVIA	4	3.00	0.82	85						17
260399	7 BOLIVIA	3	2.67	0.58	89						17
260400	7 BOLIVIA	1	3.00	0.00	100						17
260401	7 BOLIVIA	4	3.00	0.00	100						17
260402	63 PERU	3	2.67	0.58	133	3	2.00	0.00	67		16
260403	7 BOLIVIA	3	3.33	0.58	167						17
260404	7 BOLIVIA	7	2.43	1.27	94						17
261619	71 SPAIN	4	2.00	0.82	100					REDONDO LISA	17
261784	29 FRANCE	7	2.43	1.51	93					SUPER-MARMADE	17
261785	29 FRANCE	4	2.00	0.82	100					FOURNAISE F1	17
262159	71 SPAIN	4	2.50	0.58	125						17
262160	71 SPAIN	4	2.25	0.50	113						17
262162	73 SWITZERLAND	4	2.50	0.58	125						17
262173	31 GERMANY	4	2.00	0.82	62					WEIHENSTEPHAN X FREISING	17
262174	31 GERMANY	4	2.50	0.58	77					WEIHENSTEPHAN X FREISING	17
262175	31 GERMANY	4	2.50	0.58	77					ESCHWEILER X DUREN	17
262892	51 MEXICO	4	2.50	0.58	77						17
262906	71 SPAIN	5	2.00	1.00	67					LA ROCHAPES	17
262907	71 SPAIN	3	2.33	1.15	72					ESTONORS	17
262908	71 SPAIN	4	2.50	0.58	77					PALO SANTO	17
262909	71 SPAIN	3	2.67	0.58	82					PERFECTION	17
262910	71 SPAIN	4	2.50	1.00	77					SAN MARZANO	17
262929	80 USSR	4	3.00	0.00	109					GRUNTOVY GRIBOVSKY	17
262930	80 USSR	4	3.00	0.00	109					GRUNTOVY SKOROSPELY 1165	17
262931	80 USSR	7	2.71	1.11	84					BELORUSSKY 225	17
262932	80 USSR	4	3.25	0.50	118					SHTAMBOVY KARLIK 1185	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
262933	80 USSR	4	3.00	0.00	109					EREVANI 14	17
262934	80 USSR	4	2.00	0.82	73					MALINTKA 101	17
262935	80 USSR	4	2.75	0.50	100					BIISKY ZHELTY	17
262936	80 USSR	4	3.00	0.00	109					SHTAMBOVY RANNY 1563	17
262937	80 USSR	2	3.00	0.00	109					SHTAMBOVY KARTOFELNOLISTNY 164	17
262938	80 USSR	4	2.75	0.50	110					KISELEVSKY	17
262939	80 USSR	4	2.25	0.96	90					TALALIKHIN 186	17
262940	80 USSR	4	2.25	0.50	90					KORNEEVSKY	17
262991	54 NETHERLANDS	4	2.50	0.58	100					EXCELSIOR	17
262992	54 NETHERLANDS	3	2.33	1.15	93					TUCKWOOD	17
262993	54 NETHERLANDS	4	2.25	0.96	90					NUMBER TEN	17
262994	54 NETHERLANDS	4	2.50	0.58	100					GLORY	17
262995	54 NETHERLANDS	3	2.67	0.58	107					AILSA CRAIGH	17
262996	54 NETHERLANDS	4	2.75	0.50	110					MONEYMAKER	17
262997	54 NETHERLANDS	4	2.50	0.58	91					RONALD F.	17
262998	54 NETHERLANDS	3	2.33	0.58	85					POOLS GLAS	17
262999	54 NETHERLANDS	4	1.75	0.50	64					PRIDE SELECTION B	17
263000	54 NETHERLANDS	3	2.67	0.58	97					PRIDE SELECTION C	17
263589	51 MEXICO	2	2.50	0.71	91	7	1.86	0.90	67		12
263710	66 PUERTO RICO	4	2.75	0.50	100						17
263711	66 PUERTO RICO	3	2.33	0.58	85						17
263712	66 PUERTO RICO	4	2.75	0.50	100						17
263713	66 PUERTO RICO	8	2.13	0.99	60						17
263714	66 PUERTO RICO	4	2.25	0.50	75						17
263715	66 PUERTO RICO	4	2.00	0.00	67						17
263716	66 PUERTO RICO	4	2.25	0.50	75						17
263717	66 PUERTO RICO	4	2.50	0.58	83						17
263718	66 PUERTO RICO	3	3.00	0.00	100						17
263719	66 PUERTO RICO	4	2.50	0.58	83						17
263720	66 PUERTO RICO	4	3.25	0.50	108						17
263721	66 PUERTO RICO	4	3.00	0.82	100						17
263722	66 PUERTO RICO	3	3.00	0.00	100						17
263723	66 PUERTO RICO	4	3.00	0.00	100						17
263724	66 PUERTO RICO	4	2.75	0.50	92						17
263725	66 PUERTO RICO	2	3.00	0.00	100						17
263726	66 PUERTO RICO	4	2.75	0.50	92						17
264336	71 SPAIN	1	3.00	0.00	100					RACHAPEA	17
264548	14 CHILE	4	2.75	0.50	92					LIMACHINO	17
265955	79 USA HAWAII	4	3.50	0.58	117					ANAHU	17
265956	79 USA HAWAII	3	3.00	0.00	100					KOLEA C	17
265957	79 USA HAWAII	4	3.50	0.58	117						17
266375	63 PERU	4	3.00	0.00	100						9
266376	63 PERU	2	3.00	0.00	100						9
268107	51 MEXICO	4	3.00	0.00	100					COTAXTLA I	17
268407	2 AFGHANISTAN	4	3.25	0.50	108						17
269139	54 NETHERLANDS	4	2.75	0.50	92	3	1.33	1.15	48		13
269140	54 NETHERLANDS	6	3.00	1.10	92	7	0.00	0.00	0		13
269141	54 NETHERLANDS	4	3.00	0.00	100	4	2.25	0.50	82		13
269142	54 NETHERLANDS	4	2.75	0.50	92	3	2.33	0.58	85		13
269512	82 WEST PAKISTAN	2	2.50	0.71	83						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
269513	82 WEST PAKISTAN	4	3.00	0.00	86						17
269514	82 WEST PAKISTAN	4	3.00	0.00	86						17
270149	51 MEXICO	3	3.00	0.00	86						17
270150	51 MEXICO	3	3.00	0.00	86	3	2.00	0.00	73		16
270171	79 USA MICHIGAN	4	2.50	0.58	71					BALTIMORE	17
270172	79 USA OHIO	4	3.00	0.00	86					BONNIE BEST	17
270173	79 USA OHIO	4	3.00	0.00	86					BOUNTY	17
270174	79 USA MICHIGAN	4	2.75	0.50	79					BREAK O'DAY	17
270175	79 USA MICHIGAN	3	3.00	0.00	86					CARDINAL	17
270176	11 CANADA	4	3.00	0.00	86					COBOURG	17
270177	79 USA NEW YORK	4	2.75	0.50	79					COMET	17
270178	79 USA OHIO	2	3.00	0.00	86					COOPER'S SPECIAL	17
270179	79 USA MICHIGAN	4	3.00	0.00	86					CRACK PROOF PINK	17
270180	79 USA OHIO	4	2.75	0.50	79					DWARF CHAMPION	17
270181	79 USA OHIO	4	2.75	0.50	79	4	3.00	0.00	109	EARLIANA PENNSYLVANIA	17
270182	79 USA CONNECTICUT	4	2.75	0.50	85	4	2.50	0.58	83	EARLY RED	17
270183	79 USA MICHIGAN	4	2.75	0.50	85					FIRESTEEL	17
270184	79 USA NEW JERSEY	3	2.67	0.58	82					GARDEN STATE	17
270185	79 USA OHIO	3	3.33	0.58	103					GLOBE ASSOCIATION	17
270186	79 USA OHIO	4	3.50	0.58	108					GLOBE LIVINGSTON	17
270187	79 USA OHIO	4	3.75	0.50	115					GLOBE, STRAIN A	17
270188	79 USA OHIO	3	3.33	0.58	103					GLOBELLE	17
270189	79 USA CONNECTICUT	3	4.00	0.00	123					GROWTHENS GLOBE	17
270190	79 USA CONNECTICUT	4	3.00	0.00	92					GULF STATE MARKET	17
270191	79 USA ILLINOIS	4	3.00	0.00	80					INDIANA BALTIMORE	17
270192	79 USA MICHIGAN	2	2.50	0.71	67					JOHN BAER	17
270193	79 USA NEW JERSEY	4	3.25	0.50	87					J. T. DORRANCE	17
270194	79 USA MICHIGAN	3	3.33	0.58	89					JUNE PINK	17
270195	79 USA MICHIGAN	4	3.00	0.00	80					LONG RED	17
270196	79 USA MICHIGAN	3	4.00	0.00	107					LOUISIANA PINK	17
270197	79 USA LOUISIANA	4	2.75	0.50	92					LOUISIANA RED	17
270198	79 USA OHIO	4	3.00	0.00	100					MARGLOBE	17
270199	79 USA MICHIGAN	3	3.00	0.00	100					MICHIGAN STATE FORCING	17
270200	79 USA MICHIGAN	3	4.00	0.00	133					MORSE'S 498	17
270201	79 USA OHIO	4	2.00	0.82	67					NEW STONE	17
270202	79 USA MICHIGAN	3	3.00	0.00	100					OXHEART	17
270203	79 USA CONNECTICUT	4	3.00	0.00	100					PAN AMERICA	17
270204	79 USA MICHIGAN	4	3.00	0.00	100					PEARSON	17
270205	79 USA MICHIGAN	2	3.00	0.00	100					PENNHEART	17
270206	79 USA OHIO	4	2.75	0.50	79					PONDEROSA	17
270207	79 USA OHIO	4	3.25	0.50	93					PRITCHARD	17
270208	79 USA MICHIGAN	2	3.00	0.00	86					QUEENS	17
270209	79 USA NEW JERSEY	3	3.00	0.00	86					RUTGERS	17
270210	79 USA CONNECTICUT	4	2.75	0.50	79					SIOUX	17
270211	79 USA NEW JERSEY	4	3.00	0.00	86					STOKESDALE	17
270212	79 USA NEW YORK	4	3.00	0.00	86					VALIANT	17
270213	79 USA MICHIGAN	2	3.00	0.00	86					VICTOR	17
270214	79 USA OKLAHOMA	2	2.50	0.71	71					ANGORA	17
270215	79 USA SOUTH CAROLINA	4	2.50	0.58	83					BABY LEA	17
270216	79 USA MICHIGAN	4	3.25	0.50	108					BISON	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
270217	79 USA ILLINOIS	3	2.33	0.58	78					BLACKHAWK	17
270218	79 USA MICHIGAN	4	2.50	0.58	83					BURGESS CRACK PROOF	17
270219	11 CANADA	3	2.33	0.58	78					CAMDOWN	17
270220	79 USA SOUTH CAROLINA	4	4.00	0.00	133					DWARF RECESSIVE	17
270221	79 USA ILLINOIS	3	3.00	0.00	100					EARLY BALTIMORE	17
270222	79 USA ILLINOIS	4	2.25	0.50	75					EARLY CANNER	17
270223	79 USA CALIFORNIA	3	3.00	0.00	100					EARLY HYBRID GIANT	17
270224	79 USA CALIFORNIA	4	3.25	0.50	93					EARLY HYCROSS	17
270225	79 USA CALIFORNIA	4	2.75	0.50	79					EARLY PROLIFIC	17
270226	79 USA MICHIGAN	4	3.00	0.00	86					EARLY SANTA CLARA CANNER	17
270227	79 USA SOUTH CAROLINA	4	3.00	0.00	86					EXTREME DWARF DETERMINATE	17
270228	79 USA NEW YORK	4	3.50	0.58	100					FIREBALL	17
270229	79 USA CALIFORNIA	4	2.50	0.58	71					GIANT KING HYBRID	17
270230	79 USA TEXAS	2	3.00	0.00	86					GOLDEN SPHERE	17
270231	11 CANADA	4	3.00	0.00	86					HARKNESS	17
270232	79 USA MISSOURI	4	3.00	0.00	86					HOMESTEAD	17
270233	11 CANADA	4	3.25	0.50	100					IMP. WASATCH BEAUTY	17
270234	79 USA UTAH	3	3.00	0.00	92					LORAN BLOOD	17
270235	79 USA FLORIDA	3	3.00	0.00	92					MANSHILL	17
270236	79 USA OHIO	4	3.50	0.58	108					MANALUCIE	17
270237	79 USA FLORIDA	2	3.00	0.00	92					MANASOTA	17
270238	79 USA SOUTH CAROLINA	4	2.25	0.96	69					NORDUKE	17
270239	79 USA OHIO	4	2.75	0.50	85					OHIO W-R BROOKSTON	17
270240	11 CANADA	4	3.00	0.00	92					PENNRED	17
270241	79 USA MARYLAND	2	3.00	0.00	92					PINKSHIPPER	17
270242	79 USA ILLINOIS	4	3.00	0.00	86					PRAIRIANA	17
270243	79 USA MARYLAND	27	2.56	1.12	83					ROMA	17
270244	79 USA MISSOURI	3	2.67	0.58	76					SOUTHLAND	17
270245	11 CANADA	4	3.25	0.50	93					POTENTATE	17
270246	79 USA SOUTH CAROLINA	4	3.00	0.00	86					STEMLESS PENN ORANGE	17
270247	11 CANADA	4	3.00	0.00	86					STERLING CASTLE	17
270248	79 USA SOUTH CAROLINA	3	2.33	0.58	67					SUGAR	17
270249	79 USA MARYLAND	4	2.50	0.58	71					SUNRAY	17
270250	79 USA TEXAS	3	2.67	0.58	76					TEXTO 2	17
270251	79 USA MISSOURI	4	3.25	0.50	108					URBANA	17
270252	11 CANADA	4	2.25	0.96	75					V-121	17
270253	11 CANADA	8	2.75	0.89	77					VAGABOND	17
270254	11 CANADA	4	2.50	0.58	83					VETO MOLD	17
270255	11 CANADA	3	2.67	0.58	89					VULCAN	17
270256	79 USA MICHIGAN	3	3.00	0.00	100					WHITE BEAUTY	17
270257	79 USA SOUTH CAROLINA	4	4.00	0.00	133					WHITE FLOWERED MARGLOBE	17
270258	79 USA WISCONSIN	4	3.00	0.82	100					BUDZIEN	17
270259	79 USA MICHIGAN	4	3.25	0.50	108					BURGESS EARLY WONDER	17
270260	79 USA MICHIGAN	4	3.00	0.00	109					BURGESS LEMON	17
270261	79 USA MICHIGAN	4	2.50	0.58	91					BURGESS MAMMOUTH WONDER	17
270262	79 USA MARYLAND	4	2.75	0.50	100					CHESAPEAKE	17
270263	79 USA OHIO	4	2.25	0.50	82					CHICAGO #1	17
270264	79 USA NEW YORK	3	2.33	0.58	85					CORNELL CRACK RESISTANT 55-512	17
270265	79 USA NEW YORK	4	2.50	0.58	91					CORNELL CRACK RESISTANT 55-539	17
270266	79 USA NEW YORK	22	2.45	0.96	92					CORNELL CRACK RESISTANT 55-542	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
270267	79 USA NEW YORK	4	2.50	0.58	91					CORNELL CRACK RES. 55-548-2	17
270268	79 USA NEW YORK	4	2.50	0.58	91					CORNELL CRACK RES. 55-549-2	17
270269	79 USA OHIO	8	1.88	1.55	70					EARLY SCARLETT	17
270270	79 USA NEW YORK	4	1.75	0.96	140					GEM	17
270272	79 USA OHIO	4	2.00	0.82	160					GOLD DUST CRACK PROOF	17
270273	11 CANADA	7	2.14	1.07	86					HARROW	17
270274	79 USA OHIO	8	2.00	1.07	86					MARHIO	17
270275	79 USA OHIO	4	1.75	0.96	140					MARIETTA #1	17
270276	79 USA NEW YORK	4	2.00	0.82	160					MASTER MARGLOBE	17
270277	79 USA OHIO	4	2.50	0.58	200					OHIO W-R GLOBE	17
270278	79 USA OHIO	4	2.00	0.00	160					OHIO W-R JUBILEE	17
270279	79 USA NEW JERSEY	4	2.00	0.00	133					ONTARIA	17
270280	79 USA OHIO	4	2.50	1.00	167					PEARL HARBOR	17
270281	79 USA TEXAS	4	2.00	0.82	133					PORTER TOMATO	17
270282	79 USA INDIANA	4	3.00	0.00	200					PURDUE 1361	17
270284	79 USA TEXAS	11	2.09	0.70	100					S 1446 SUMMER CHERRY	17
270286	79 USA OHIO	8	2.13	0.99	88					WESTERNRED	17
270403	51 MEXICO	8	2.38	1.30	96						17
270404	51 MEXICO	4	2.75	0.50	183						17
270405	51 MEXICO	4	2.50	1.00	167						17
270406	51 MEXICO	3	2.00	0.00	89						17
270407	51 MEXICO	4	2.75	0.50	122						17
270408	51 MEXICO	4	2.25	0.96	100						17
270409	51 MEXICO	4	2.50	1.00	111						17
270410	51 MEXICO	4	2.50	0.58	111						17
270411	51 MEXICO	4	1.75	0.50	78						17
270412	51 MEXICO	4	2.75	0.50	122						17
270413	51 MEXICO	4	3.00	0.00	133						17
270414	51 MEXICO	4	1.75	0.50	78						17
270415	51 MEXICO	4	2.00	0.00	73						17
270416	51 MEXICO	4	3.00	0.00	109						17
270417	51 MEXICO	4	3.00	0.00	109						17
270418	51 MEXICO	4	2.50	0.58	91						17
270419	51 MEXICO	4	1.75	0.96	64						17
270420	51 MEXICO	4	2.50	0.58	91						17
270421	51 MEXICO	4	1.75	0.50	64						17
270422	51 MEXICO	3	2.33	0.58	85						17
270423	51 MEXICO	4	2.50	0.58	91						17
270424	51 MEXICO	4	2.25	0.50	100						17
270425	51 MEXICO	4	2.75	0.50	122						17
270426	51 MEXICO	4	2.50	0.58	111						17
270427	51 MEXICO	4	2.00	0.00	89						17
270428	51 MEXICO	4	1.75	0.50	78						17
270429	51 MEXICO	7	1.29	0.76	82						17
270430	51 MEXICO	4	1.50	0.58	150						17
270431	51 MEXICO	4	2.00	0.00	200						17
270432	51 MEXICO	7	1.71	0.76	100						17
270433	51 MEXICO	7	1.14	0.90	69						17
270434	51 MEXICO	4	2.25	0.50	129						17
270435	51 MEXICO	4	1.75	0.50	100	4	0.00	0.00	0		9

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
270436	51 MEXICO	4	1.75	0.50	100	4	3.00	0.00	109		16
270437	51 MEXICO	4	2.00	0.00	114	4	3.00	0.00	109		16
270438	51 MEXICO	4	2.50	0.58	143	4	3.00	0.00	109		16
270439	51 MEXICO	4	2.00	0.00	114	4	3.00	0.00	100		12
270440	51 MEXICO	4	2.00	0.00	114	4	2.75	0.50	92		12
270441	51 MEXICO	4	2.50	0.58	143	4	3.00	0.00	100		12
270442	51 MEXICO	4	1.75	0.50	78	4	3.00	0.00	100		12
270443	51 MEXICO	4	2.50	0.58	111	4	3.00	0.00	100		12
270444	51 MEXICO	4	2.75	0.50	122	4	3.00	0.00	100		12
270445	51 MEXICO	4	2.25	0.96	100	4	3.00	0.00	100		12
270446	51 MEXICO	4	2.00	0.00	89	4	3.00	0.00	100		12
270447	51 MEXICO	4	2.00	0.00	89	4	3.00	0.00	109		12
270448	51 MEXICO	4	2.25	0.50	100	4	3.00	0.00	109		12
270449	51 MEXICO	4	2.50	0.58	111	4	3.25	0.50	118		12
270450	51 MEXICO	4	3.00	0.00	120	4	3.25	0.50	118		12
270451	51 MEXICO	4	2.50	0.58	100	4	3.25	0.50	118		12
270452	51 MEXICO	4	2.75	0.50	110	4	3.25	0.50	118		12
270453	51 MEXICO	4	2.25	0.50	90	4	3.00	0.00	109		12
270454	51 MEXICO	4	3.00	0.00	120	4	3.00	0.00	120		16
271122	11 CANADA	4	2.25	0.50	90					OTTAWA 57 B1C4	17
271123	11 CANADA	4	2.25	0.50	90					OTTAWA 57 K1A1	17
271124	11 CANADA	3	2.00	0.00	80					OTTAWA 57 T1A	17
271381	39 INDIA	4	1.50	0.58	86					JAIPUR	17
271382	39 INDIA	8	1.50	0.93	102					BEWAR	17
271383	39 INDIA	4	2.50	0.58	143					MEERUTI	17
271384	39 INDIA	4	2.25	0.50	129						17
271385	39 INDIA	12	1.42	1.08	59						17
271386	39 INDIA	3	1.33	0.58	76						17
271387	39 INDIA	4	2.25	0.50	129						17
271388	39 INDIA	4	2.25	0.50	129						17
271481	39 INDIA	4	1.75	0.50	70						17
271482	39 INDIA	4	2.00	0.00	80						17
271780	69 SOUTH AFRICA	4	2.75	0.50	110					HOMESTEAD	17
271781	69 SOUTH AFRICA	4	2.25	0.50	90					RED KAHKI	17
272219	44 ITALY	3	2.33	0.58	93					GIMAR	17
272626	26 EL SALVADOR	4	1.25	0.50	50						17
272627	26 EL SALVADOR	4	2.25	0.50	90						17
272628	26 EL SALVADOR	3	2.67	0.58	107						17
272629	26 EL SALVADOR	2	2.50	0.71	100						17
272630	26 EL SALVADOR	4	3.00	0.00	120						17
272631	26 EL SALVADOR	3	3.00	0.00	120						17
272632	26 EL SALVADOR	4	3.00	0.00	120						17
272633	26 EL SALVADOR	4	2.50	0.58	100						17
272634	26 EL SALVADOR	4	2.25	0.50	90						17
272635	20 COSTA RICA	4	2.25	0.50	90						17
272636	20 COSTA RICA	4	1.75	0.50	70						17
272637	20 COSTA RICA	4	2.75	0.50	110						17
272638	20 COSTA RICA	4	1.75	0.50	70						17
272640	26 EL SALVADOR	4	2.50	0.58	100						17
272641	26 EL SALVADOR	4	3.00	0.00	120	4	2.75	0.50	100		12

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
272643	26 EL SALVADOR	4	2.75	0.50	110						17
272644	36 GUATEMALA	3	3.00	0.00	120						17
272645	36 GUATEMALA	4	2.75	0.50	110						17
272646	36 GUATEMALA	4	3.00	0.00	120	4	3.00	0.00	120		16
272647	36 GUATEMALA	4	3.00	0.00	129						17
272648	36 GUATEMALA	4	2.50	0.58	107						17
272649	36 GUATEMALA	4	2.25	0.50	96						17
272650	36 GUATEMALA	4	2.75	0.50	118	3	3.67	0.58	122		12
272651	36 GUATEMALA	4	2.75	0.50	118						17
272652	36 GUATEMALA	4	2.25	0.50	96						17
272653	36 GUATEMALA	4	2.00	0.00	86						17
272654	36 GUATEMALA	4	2.25	0.50	96	4	2.00	0.00	80		16
272655	36 GUATEMALA	4	3.00	0.00	113						17
272656	36 GUATEMALA	4	2.50	0.58	94						17
272657	36 GUATEMALA	4	2.50	0.58	94	4	2.75	0.50	110		16
272658	36 GUATEMALA	4	2.75	0.50	103						17
272660	36 GUATEMALA	4	2.25	0.50	84						17
272662	36 GUATEMALA	4	2.75	0.50	103						17
272663	36 GUATEMALA	4	2.75	0.50	103						17
272664	26 EL SALVADOR	24	2.75	0.85	96						17
272665	26 EL SALVADOR	4	3.00	0.00	113						17
272666	26 EL SALVADOR	4	3.00	0.00	113						17
272667	26 EL SALVADOR	4	3.00	0.00	113						17
272668	26 EL SALVADOR	4	2.75	0.50	103						17
272669	26 EL SALVADOR	4	2.75	0.50	103						17
272670	26 EL SALVADOR	4	2.75	0.50	103						17
272671	26 EL SALVADOR	4	2.50	0.58	94						17
272672	26 EL SALVADOR	4	3.00	0.00	113						17
272673	26 EL SALVADOR	2	3.00	0.00	120						17
272674	26 EL SALVADOR	4	3.00	0.00	120						17
272675	26 EL SALVADOR	4	3.00	0.00	120						17
272676	26 EL SALVADOR	3	3.00	0.00	120						17
272677	26 EL SALVADOR	3	3.00	0.00	120						17
272678	26 EL SALVADOR	4	2.75	0.50	110						17
272679	26 EL SALVADOR	4	3.00	0.00	120						17
272680	26 EL SALVADOR	4	2.75	0.50	110						17
272681	26 EL SALVADOR	4	3.00	0.00	120						17
272682	26 EL SALVADOR	4	3.00	0.00	120						17
272683	26 EL SALVADOR	4	3.00	0.00	120						17
272684	26 EL SALVADOR	4	2.75	0.50	110						17
272685	26 EL SALVADOR	4	2.50	0.58	100						17
272686	26 EL SALVADOR	4	3.00	0.00	120						17
272687	26 EL SALVADOR	4	3.00	0.00	120						17
272688	26 EL SALVADOR	4	3.00	0.00	120						17
272689	26 EL SALVADOR	4	3.00	0.00	100						17
272690	26 EL SALVADOR	4	3.00	0.00	100						17
272691	26 EL SALVADOR	4	2.50	0.58	83						17
272692	26 EL SALVADOR	4	3.00	0.00	100						17
272693	26 EL SALVADOR	4	2.75	0.50	92						17
272694	37 HONDURAS	4	2.75	0.50	92						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
272695	37 HONDURAS	2	2.50	0.71	83						17
272696	26 EL SALVADOR	4	3.00	0.00	100						17
272697	26 EL SALVADOR	4	3.00	0.00	100						17
272698	26 EL SALVADOR	4	3.00	0.00	100						17
272699	26 EL SALVADOR	4	2.75	0.50	92						17
272700	26 EL SALVADOR	4	3.00	0.00	100						17
272701	36 GUATEMALA	4	2.00	0.00	67						17
272702	36 GUATEMALA	4	1.75	0.50	58						17
272703	36 GUATEMALA	4	2.75	0.50	92						17
272704	36 GUATEMALA	4	2.75	0.50	92						17
272705	36 GUATEMALA	4	2.75	0.50	100						17
272706	36 GUATEMALA	4	3.00	0.00	109						17
272707	36 GUATEMALA	4	3.00	0.00	109						17
272708	36 GUATEMALA	4	3.00	0.00	109						17
272709	36 GUATEMALA	4	2.75	0.50	100						17
272710	36 GUATEMALA	4	3.00	0.00	109						17
272711	36 GUATEMALA	27	2.37	0.97	79						17
272712	36 GUATEMALA	3	3.00	0.00	109						17
272713	36 GUATEMALA	4	3.00	0.00	120						17
272714	36 GUATEMALA	4	2.75	0.50	110						17
272715	36 GUATEMALA	4	2.75	0.50	110						17
272716	36 GUATEMALA	3	3.00	0.00	120						17
272717	36 GUATEMALA	4	2.75	0.50	110						17
272718	36 GUATEMALA	4	2.00	0.00	80						17
272719	36 GUATEMALA	4	2.75	0.50	110						17
272720	36 GUATEMALA	4	3.00	0.00	120						17
272721	36 GUATEMALA	4	3.00	0.00	120						17
272722	36 GUATEMALA	4	1.50	0.58	60						17
272723	36 GUATEMALA	4	3.00	0.00	120						17
272724	36 GUATEMALA	4	2.50	0.58	100						17
272725	36 GUATEMALA	3	2.67	0.58	107						17
272726	36 GUATEMALA	2	2.50	0.71	100						17
272727	26 EL SALVADOR	4	2.50	0.58	100						17
272728	26 EL SALVADOR	4	2.75	0.50	110						17
272729	26 EL SALVADOR	4	2.50	0.58	111						17
272730	26 EL SALVADOR	4	3.00	0.00	133						17
272731	26 EL SALVADOR	3	2.67	0.58	119						17
272732	26 EL SALVADOR	4	3.00	0.00	133						17
272733	26 EL SALVADOR	3	2.00	1.00	89						17
272734	26 EL SALVADOR	4	1.50	0.58	67						17
272735	26 EL SALVADOR	3	2.67	0.58	119						17
272736	26 EL SALVADOR	4	1.50	0.58	67						17
272737	26 EL SALVADOR	4	2.75	0.50	138						17
272738	26 EL SALVADOR	4	2.75	0.50	138						17
272739	26 EL SALVADOR	4	2.75	0.50	138						17
272740	26 EL SALVADOR	4	2.25	0.50	113						17
272741	26 EL SALVADOR	4	2.75	0.50	138						17
272742	26 EL SALVADOR	4	2.25	0.50	113						17
272743	26 EL SALVADOR	4	2.50	0.58	125						17
272744	26 EL SALVADOR	4	2.25	0.50	113						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
272745	26 EL SALVADOR	4	2.75	0.50	110						17
272746	26 EL SALVADOR	4	2.50	0.58	100						17
272747	26 EL SALVADOR	3	2.67	0.58	107						17
272748	26 EL SALVADOR	3	3.00	0.00	120						17
272749	26 EL SALVADOR	4	2.75	0.50	110						17
272750	26 EL SALVADOR	4	2.50	0.58	100						17
272751	26 EL SALVADOR	3	2.67	0.58	107						17
272752	26 EL SALVADOR	4	2.50	0.58	100						17
272753	26 EL SALVADOR	4	2.50	0.58	125						17
272754	26 EL SALVADOR	4	2.75	0.50	138						17
272755	26 EL SALVADOR	4	2.25	0.50	113						17
272756	26 EL SALVADOR	5	2.40	0.55	111						17
272757	26 EL SALVADOR	3	2.00	0.00	89						17
272758	26 EL SALVADOR	3	2.67	0.58	119						17
272759	26 EL SALVADOR	3	3.00	0.00	133						17
272760	26 EL SALVADOR	4	2.50	0.58	91						17
272761	26 EL SALVADOR	4	3.00	0.00	109						17
272762	26 EL SALVADOR	4	3.00	0.00	109						17
272763	26 EL SALVADOR	4	1.75	0.96	64						17
272764	26 EL SALVADOR	4	2.50	0.58	91						17
272765	26 EL SALVADOR	4	3.00	0.00	109						17
272766	26 EL SALVADOR	3	2.67	0.58	97						17
272767	26 EL SALVADOR	4	2.75	0.50	100						17
272768	26 EL SALVADOR	4	2.75	0.50	100						17
272769	26 EL SALVADOR	4	2.50	0.58	83						17
272770	26 EL SALVADOR	4	2.25	0.96	75						17
272771	26 EL SALVADOR	3	2.33	0.58	78						17
272772	26 EL SALVADOR	4	2.50	0.58	83						17
272773	26 EL SALVADOR	8	2.38	0.74	75						17
272774	26 EL SALVADOR	3	2.67	0.58	89						17
272775	26 EL SALVADOR	3	3.00	0.00	100						17
272776	26 EL SALVADOR	4	2.00	0.82	67						17
272777	26 EL SALVADOR	4	3.00	0.00	100						17
272778	26 EL SALVADOR	4	3.00	0.00	120						17
272779	26 EL SALVADOR	4	3.00	0.00	120						17
272780	26 EL SALVADOR	4	2.50	0.58	100						17
272781	26 EL SALVADOR	4	2.75	0.50	110						17
272782	26 EL SALVADOR	4	2.25	0.50	90						17
272783	26 EL SALVADOR	3	2.33	0.58	93						17
272784	26 EL SALVADOR	3	2.33	0.58	93						17
272785	26 EL SALVADOR	2	2.50	0.71	100						17
272786	26 EL SALVADOR	4	2.25	0.96	90						17
272787	36 GUATEMALA	12	1.75	0.62	70						17
272788	36 GUATEMALA	4	2.00	0.82	89						17
272789	36 GUATEMALA	4	2.50	1.00	111						17
272790	36 GUATEMALA	4	1.75	0.96	78						17
272791	36 GUATEMALA	4	2.75	0.50	122						17
272792	26 EL SALVADOR	4	3.00	0.00	133						17
272793	26 EL SALVADOR	4	2.25	0.50	100						17
272794	26 EL SALVADOR	4	3.00	0.00	133						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
272795	26 EL SALVADOR	3	3.00	0.00	133						17
272796	26 EL SALVADOR	4	2.00	0.82	73						17
272797	26 EL SALVADOR	4	2.50	0.58	91						17
272798	26 EL SALVADOR	4	2.75	0.50	100						17
272799	26 EL SALVADOR	4	3.00	0.00	109						17
272800	26 EL SALVADOR	4	2.50	0.58	91						17
272801	26 EL SALVADOR	7	2.57	0.98	71						17
272803	26 EL SALVADOR	3	3.00	0.00	109						17
272804	26 EL SALVADOR	3	3.00	0.00	109						17
272805	26 EL SALVADOR	4	2.25	0.50	82						17
272806	26 EL SALVADOR	4	2.75	0.50	122						17
272807	26 EL SALVADOR	4	2.75	0.50	122						17
272808	26 EL SALVADOR	4	2.50	0.58	111						17
272809	26 EL SALVADOR	4	2.75	0.50	122						17
272810	26 EL SALVADOR	3	3.00	0.00	133						17
272811	26 EL SALVADOR	4	3.00	0.00	133						17
272812	37 HONDURAS	4	2.75	0.50	122						17
272813	26 EL SALVADOR	3	3.00	0.00	133						17
272814	26 EL SALVADOR	4	3.00	0.00	133						17
272815	26 EL SALVADOR	4	2.50	0.58	100						17
272816	26 EL SALVADOR	3	3.00	0.00	120						17
272817	26 EL SALVADOR	3	3.00	0.00	120						17
272818	26 EL SALVADOR	4	2.75	0.50	110						17
272819	26 EL SALVADOR	4	2.50	0.58	100						17
272820	26 EL SALVADOR	3	2.00	0.00	80						17
272821	26 EL SALVADOR	4	2.25	0.50	90						17
272822	26 EL SALVADOR	3	3.00	0.00	120						17
272823	26 EL SALVADOR	2	3.00	0.00	120						17
272824	26 EL SALVADOR	4	2.75	0.50	122						17
272825	26 EL SALVADOR	3	2.67	0.58	119						17
272826	26 EL SALVADOR	4	2.25	0.96	100						17
272827	26 EL SALVADOR	4	2.75	0.50	122						17
272828	26 EL SALVADOR	4	3.00	0.00	133						17
272829	26 EL SALVADOR	3	3.00	0.00	133						17
272830	26 EL SALVADOR	4	2.50	0.58	111						17
272831	26 EL SALVADOR	2	3.00	0.00	133						17
272832	26 EL SALVADOR	4	3.00	0.00	133						17
272833	26 EL SALVADOR	4	2.25	0.50	75						17
272834	26 EL SALVADOR	4	3.00	0.00	100						17
272835	26 EL SALVADOR	4	2.50	0.58	83						17
272836	26 EL SALVADOR	4	3.00	0.00	100						17
272837	26 EL SALVADOR	7	2.29	0.76	62						17
272838	26 EL SALVADOR	3	2.67	0.58	89						17
272839	26 EL SALVADOR	4	2.50	0.58	83						17
272840	26 EL SALVADOR	4	3.00	0.00	100						17
272841	26 EL SALVADOR	3	3.00	0.00	100						17
272842	26 EL SALVADOR	4	2.75	0.50	110						17
272843	26 EL SALVADOR	4	2.75	0.50	110						17
272844	26 EL SALVADOR	4	2.25	0.50	90						17
272845	26 EL SALVADOR	3	2.67	0.58	107						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
272846	26 EL SALVADOR	4	3.00	0.00	120						17
272847	26 EL SALVADOR	3	3.00	0.00	120						17
272848	26 EL SALVADOR	2	3.00	0.00	120						17
272849	26 EL SALVADOR	3	3.00	0.00	120						17
272850	26 EL SALVADOR	3	3.00	0.00	120						17
272851	26 EL SALVADOR	4	3.00	0.00	100						17
272852	26 EL SALVADOR	3	3.00	0.00	100						17
272853	26 EL SALVADOR	3	3.00	0.00	100						17
272854	26 EL SALVADOR	3	3.00	0.00	100						17
272855	26 EL SALVADOR	3	3.00	0.00	100						17
272856	37 HONDURAS	2	2.50	0.71	83						17
272857	37 HONDURAS	3	3.00	0.00	100						17
272858	37 HONDURAS	3	2.33	0.58	78						17
272859	26 EL SALVADOR	4	3.00	0.00	100						17
272860	26 EL SALVADOR	4	3.00	0.00	133						17
272861	26 EL SALVADOR	4	2.75	0.50	122						17
272862	26 EL SALVADOR	4	2.25	0.96	100						17
272863	26 EL SALVADOR	8	2.88	1.25	89						17
272864	26 EL SALVADOR	4	3.00	0.00	133						17
272865	26 EL SALVADOR	4	3.00	0.00	133						17
272866	26 EL SALVADOR	4	2.50	0.58	111						17
272867	26 EL SALVADOR	4	3.00	0.00	133						17
272868	26 EL SALVADOR	4	2.25	0.96	100						17
272869	26 EL SALVADOR	4	2.25	0.50	113						17
272870	26 EL SALVADOR	4	2.75	0.50	138						17
272871	26 EL SALVADOR	4	2.25	0.50	113						17
272872	26 EL SALVADOR	8	2.50	1.20	81						17
272873	26 EL SALVADOR	4	3.00	0.00	150						17
272874	26 EL SALVADOR	4	2.75	0.50	138						17
272875	26 EL SALVADOR	4	2.75	0.50	138						17
272876	26 EL SALVADOR	7	2.29	0.76	88						17
272877	26 EL SALVADOR	8	2.63	1.06	102						17
272878	36 GUATEMALA	4	1.75	0.96	117						17
272879	36 GUATEMALA	4	1.75	0.96	117						17
272880	36 GUATEMALA	8	2.38	0.92	101						17
272881	36 GUATEMALA	4	2.75	0.50	183						17
272882	36 GUATEMALA	7	2.43	0.79	106						17
272883	36 GUATEMALA	4	2.75	0.50	183						17
272884	36 GUATEMALA	4	3.00	0.00	200						17
272885	36 GUATEMALA	4	2.50	0.58	167						17
272886	36 GUATEMALA	4	2.75	0.50	183						17
272887	26 EL SALVADOR	3	2.33	0.58	187						17
272888	26 EL SALVADOR	4	2.75	0.50	85						17
272889	26 EL SALVADOR	4	2.75	0.50	85						17
272890	36 GUATEMALA	4	2.75	0.50	85						17
272891	36 GUATEMALA	4	2.75	0.50	85						17
272892	36 GUATEMALA	4	3.00	0.00	92						17
272893	26 EL SALVADOR	4	3.00	0.00	92						17
272894	26 EL SALVADOR	4	2.75	0.50	92						17
272895	26 EL SALVADOR	1	3.00	0.00	100						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
272896	36 GUATEMALA	4	3.00	0.00	100						17
272897	26 EL SALVADOR	4	3.25	0.50	108						17
272898	36 GUATEMALA	4	3.00	0.00	100						17
272899	36 GUATEMALA	4	3.00	0.00	100						17
272900	26 EL SALVADOR	4	2.75	0.50	92						17
272901	26 EL SALVADOR	4	3.50	0.58	117						17
272902	26 EL SALVADOR	4	3.00	0.00	100						17
272903	26 EL SALVADOR	4	3.25	0.50	108						17
272904	26 EL SALVADOR	4	2.75	0.96	92						17
272905	26 EL SALVADOR	4	2.50	0.58	83						17
272906	26 EL SALVADOR	4	3.50	0.58	117						17
272907	26 EL SALVADOR	4	3.00	0.00	100						17
272908	26 EL SALVADOR	4	3.50	0.58	117						17
272909	26 EL SALVADOR	4	2.50	0.58	83						17
272910	26 EL SALVADOR	4	3.25	0.50	93						17
272911	26 EL SALVADOR	4	2.75	0.50	79						17
272912	26 EL SALVADOR	4	3.25	0.50	93						17
272913	26 EL SALVADOR	4	3.50	0.58	100						17
272914	26 EL SALVADOR	4	3.00	0.00	86						17
272915	26 EL SALVADOR	4	1.75	0.96	140						17
272916	26 EL SALVADOR	4	3.00	0.00	86						17
272917	26 EL SALVADOR	7	1.43	0.98	75						17
272918	26 EL SALVADOR	7	2.00	1.00	106						17
272919	26 EL SALVADOR	8	1.88	0.83	95						17
272920	26 EL SALVADOR	8	2.25	0.89	106						17
272921	26 EL SALVADOR	4	1.75	0.96	117						17
272922	26 EL SALVADOR	2	2.50	0.71	91						17
272923	26 EL SALVADOR	3	2.67	0.58	97						17
272924	26 EL SALVADOR	3	2.33	0.58	85						17
272925	26 EL SALVADOR	4	2.75	0.50	100						17
272926	26 EL SALVADOR	4	2.75	0.50	100						17
272927	37 HONDURAS	4	2.50	0.58	91						17
272928	37 HONDURAS	4	3.00	0.00	109						17
272929	37 HONDURAS	4	3.50	0.58	127						17
272930	26 EL SALVADOR	4	2.25	0.50	180						17
272931	26 EL SALVADOR	4	2.00	0.82	160						17
272932	26 EL SALVADOR	7	1.71	1.11	90						17
272933	26 EL SALVADOR	4	2.25	0.96	180						17
272934	26 EL SALVADOR	8	2.13	0.99	106						17
272935	26 EL SALVADOR	4	1.75	1.26	140						17
272936	26 EL SALVADOR	4	2.25	0.96	180						17
272937	36 GUATEMALA	8	2.00	1.07	102						17
272938	36 GUATEMALA	7	1.86	0.69	104						17
272939	36 GUATEMALA	4	2.00	0.00	80						17
272940	36 GUATEMALA	8	2.00	0.93	77						17
272941	36 GUATEMALA	4	1.75	0.50	70						17
272942	36 GUATEMALA	4	2.00	0.00	80						17
272943	26 EL SALVADOR	4	2.00	0.82	80						17
272944	26 EL SALVADOR	4	1.75	0.50	140						17
272945	26 EL SALVADOR	4	1.50	0.58	120						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
272946	26 EL SALVADOR	3	1.33	0.58	107						17
272947	37 HONDURAS	4	2.50	0.58	83						17
272948	37 HONDURAS	4	2.25	0.50	75						17
272949	26 EL SALVADOR	4	3.00	0.00	100						17
272950	26 EL SALVADOR	4	2.50	0.58	83						17
272951	26 EL SALVADOR	4	2.50	0.58	83						17
272952	26 EL SALVADOR	4	3.25	0.50	108						17
272953	26 EL SALVADOR	4	2.25	0.50	75						17
272954	26 EL SALVADOR	4	3.00	0.82	92						17
272955	26 EL SALVADOR	4	2.50	0.58	77						17
272956	36 GUATEMALA	4	2.75	0.50	85						17
272957	36 GUATEMALA	4	2.50	0.58	77						17
272958	36 GUATEMALA	4	3.25	0.50	100						17
272959	36 GUATEMALA	4	3.50	0.58	108						17
272960	36 GUATEMALA	4	3.25	0.50	100						17
272961	36 GUATEMALA	4	3.00	0.00	92						17
272962	36 GUATEMALA	7	2.71	1.11	84						17
272963	37 HONDURAS	4	2.25	0.50	150						17
272964	26 EL SALVADOR	4	1.50	0.58	100						17
272965	26 EL SALVADOR	4	1.75	0.50	117						17
272966	26 EL SALVADOR	4	2.50	0.58	91						17
272967	26 EL SALVADOR	4	3.00	0.00	109						17
272968	26 EL SALVADOR	4	2.00	1.15	133						17
272969	26 EL SALVADOR	4	3.50	0.58	127						17
272970	26 EL SALVADOR	4	2.00	0.00	133						17
272971	26 EL SALVADOR	4	2.00	0.00	133						17
272972	26 EL SALVADOR	4	2.50	0.58	167						17
272973	26 EL SALVADOR	4	2.75	0.50	100						17
272974	26 EL SALVADOR	4	2.00	0.82	133						17
272975	26 EL SALVADOR	4	2.25	0.50	150						17
272976	26 EL SALVADOR	4	2.75	0.50	100						17
272977	26 EL SALVADOR	3	2.00	0.00	100						17
272978	26 EL SALVADOR	4	2.25	0.50	113						17
272979	26 EL SALVADOR	4	2.75	0.50	100						17
272980	26 EL SALVADOR	4	3.00	0.00	109						17
272981	26 EL SALVADOR	4	2.75	0.50	100						17
272982	37 HONDURAS	4	2.50	1.00	91						17
272983	26 EL SALVADOR	4	3.25	0.50	118						17
272984	36 GUATEMALA	4	3.00	0.00	109						17
272985	36 GUATEMALA	4	2.25	0.96	113						17
272986	36 GUATEMALA	4	2.75	0.50	138						17
272987	36 GUATEMALA	4	2.50	0.58	125						17
272988	36 GUATEMALA	4	2.50	0.58	125						17
272989	36 GUATEMALA	4	2.50	0.58	125						17
272990	36 GUATEMALA	4	3.00	0.00	109						17
272991	26 EL SALVADOR	4	2.25	0.50	113						17
272992	26 EL SALVADOR	4	2.50	0.58	125						17
272993	26 EL SALVADOR	4	3.00	0.00	109						17
272994	26 EL SALVADOR	4	2.75	0.50	100						17
272995	26 EL SALVADOR	4	3.00	0.00	109						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
272996	26 EL SALVADOR	4	2.75	0.50	79						17
272997	26 EL SALVADOR	4	2.50	0.58	71						17
272998	26 EL SALVADOR	4	3.25	0.50	93						17
272999	26 EL SALVADOR	4	3.25	0.50	93						17
273000	26 EL SALVADOR	4	2.50	0.58	71						17
273001	26 EL SALVADOR	4	2.50	0.58	71						17
273002	26 EL SALVADOR	4	1.75	0.50	140						17
273003	26 EL SALVADOR	4	2.00	0.82	160						17
273004	26 EL SALVADOR	4	1.75	0.96	140						17
273005	26 EL SALVADOR	8	2.25	0.89	103						17
273006	26 EL SALVADOR	4	2.25	0.96	180						17
273007	26 EL SALVADOR	4	3.00	0.00	109						17
273008	26 EL SALVADOR	3	2.67	0.58	97						17
273009	26 EL SALVADOR	4	2.25	0.50	82						17
273010	26 EL SALVADOR	4	2.75	0.50	100						17
273011	36 GUATEMALA	4	2.50	0.58	91						17
273012	36 GUATEMALA	8	2.25	0.89	70						17
273013	26 EL SALVADOR	4	2.00	0.00	73						17
273014	26 EL SALVADOR	4	2.00	0.00	73						17
273015	26 EL SALVADOR	4	1.75	0.50	64						17
273016	26 EL SALVADOR	4	3.00	0.00	109						17
273017	26 EL SALVADOR	4	3.00	0.00	109						17
273018	26 EL SALVADOR	4	3.75	0.50	136						17
273019	26 EL SALVADOR	4	3.75	0.50	136						17
273020	26 EL SALVADOR	4	3.25	0.50	118						17
273021	26 EL SALVADOR	4	3.50	0.58	127						17
273022	26 EL SALVADOR	4	4.00	0.00	145						17
273023	26 EL SALVADOR	4	3.75	0.50	136						17
273024	26 EL SALVADOR	4	3.00	0.00	86						17
273025	26 EL SALVADOR	4	2.00	0.82	160						17
273026	26 EL SALVADOR	4	2.00	0.82	160						17
273027	26 EL SALVADOR	4	3.00	0.00	86						17
273028	26 EL SALVADOR	4	2.00	0.00	160						17
273029	36 GUATEMALA	8	1.88	0.83	86						17
273030	36 GUATEMALA	3	2.67	0.58	76						17
273031	26 EL SALVADOR	4	3.00	0.00	86						17
273032	26 EL SALVADOR	4	3.00	0.00	86						17
273033	26 EL SALVADOR	4	3.25	0.50	93						17
273034	26 EL SALVADOR	4	1.75	0.96	175						17
273035	26 EL SALVADOR	4	1.50	0.58	150						17
273036	26 EL SALVADOR	4	2.00	0.82	200						17
273037	26 EL SALVADOR	7	2.29	0.95	110						17
273038	26 EL SALVADOR	3	1.67	0.58	167						17
273039	26 EL SALVADOR	3	2.00	0.00	200						17
273040	26 EL SALVADOR	3	2.00	0.00	200						17
273041	26 EL SALVADOR	4	2.50	0.58	100						17
273042	26 EL SALVADOR	4	2.25	0.96	225						17
273043	26 EL SALVADOR	4	2.25	0.96	225						17
273044	26 EL SALVADOR	4	2.25	0.50	100						17
273045	26 EL SALVADOR	4	1.75	0.50	78						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
273046	37 HONDURAS	8	2.25	0.89	73						17
273047	26 EL SALVADOR	4	2.50	0.58	111						17
273048	26 EL SALVADOR	4	2.75	0.50	122						17
273049	36 GUATEMALA	8	1.88	1.55	58						17
273050	36 GUATEMALA	8	1.88	1.36	60						17
273051	36 GUATEMALA	8	1.75	0.71	60						17
273052	36 GUATEMALA	8	2.13	0.83	73						17
273053	36 GUATEMALA	8	2.00	1.51	63						17
273054	26 EL SALVADOR	4	2.00	0.00	114						17
273055	36 GUATEMALA	4	1.75	0.50	100						17
273056	36 GUATEMALA	8	2.00	1.07	71						17
273057	26 EL SALVADOR	4	2.25	0.50	129						17
273058	26 EL SALVADOR	4	3.00	0.00	171						17
273059	26 EL SALVADOR	4	3.00	0.00	171						17
273060	26 EL SALVADOR	4	2.25	0.96	129						17
273061	26 EL SALVADOR	4	2.50	0.58	143						17
273062	26 EL SALVADOR	4	1.75	0.50	100						17
273063	26 EL SALVADOR	3	3.00	0.00	100						17
273064	26 EL SALVADOR	4	3.00	0.00	100						17
273065	26 EL SALVADOR	4	2.50	0.58	83						17
273066	26 EL SALVADOR	4	3.00	0.00	100						17
273067	26 EL SALVADOR	4	2.50	0.58	83						17
273068	26 EL SALVADOR	4	2.25	0.50	75						17
273069	26 EL SALVADOR	4	2.50	0.58	83						17
273070	26 EL SALVADOR	4	2.75	0.50	92						17
273071	26 EL SALVADOR	4	2.25	0.96	75						17
273072	26 EL SALVADOR	8	2.13	1.25	71						17
273073	26 EL SALVADOR	8	1.88	0.83	63						17
273074	26 EL SALVADOR	4	2.50	0.58	83						17
273075	26 EL SALVADOR	4	3.00	0.00	100						17
273076	26 EL SALVADOR	8	2.00	1.07	67						17
273077	26 EL SALVADOR	8	2.00	0.76	67						17
273078	26 EL SALVADOR	4	2.50	0.58	83						17
273079	36 GUATEMALA	3	3.00	0.00	100						17
273080	36 GUATEMALA	4	3.00	0.00	100						17
273081	36 GUATEMALA	4	2.75	0.50	110						17
273082	36 GUATEMALA	4	2.50	0.58	83						17
273083	36 GUATEMALA	4	2.50	0.58	83						17
273084	36 GUATEMALA	3	3.00	0.00	100						17
273085	26 EL SALVADOR	8	1.38	1.30	46						17
273086	36 GUATEMALA	7	2.29	0.95	72						17
273087	36 GUATEMALA	8	2.25	0.89	75						17
273088	36 GUATEMALA	4	1.75	0.96	58						17
273089	26 EL SALVADOR	3	3.00	0.00	100						17
273090	26 EL SALVADOR	4	2.25	0.96	75						17
273091	26 EL SALVADOR	4	2.50	0.58	83						17
273092	26 EL SALVADOR	4	3.00	0.00	100						17
273093	36 GUATEMALA	4	3.00	0.00	100						17
273094	26 EL SALVADOR	4	3.00	0.00	100						17
273095	26 EL SALVADOR	6	2.83	1.47	80						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
273099	37 HONDURAS	4	3.00	0.00	80						17
273100	26 EL SALVADOR	4	3.00	0.00	80						17
273101	36 GUATEMALA	4	4.00	0.00	107						17
273102	36 GUATEMALA	4	3.50	0.58	93						17
273103	36 GUATEMALA	4	2.50	0.58	67						17
273104	36 GUATEMALA	3	3.00	1.00	80						17
273105	26 EL SALVADOR	4	2.75	0.50	73						17
273106	26 EL SALVADOR	4	3.00	1.41	80						17
273107	26 EL SALVADOR	12	2.33	0.65	77						17
273108	26 EL SALVADOR	8	2.75	0.46	93						17
273109	26 EL SALVADOR	8	2.63	0.52	88						17
273110	26 EL SALVADOR	11	2.45	0.69	83						17
273111	26 EL SALVADOR	7	2.86	0.90	93						17
273112	26 EL SALVADOR	12	2.50	1.17	84						17
273113	26 EL SALVADOR	8	2.75	1.49	87						17
273114	36 GUATEMALA	11	2.55	0.82	86						17
273115	26 EL SALVADOR	8	3.50	0.53	99						17
273116	26 EL SALVADOR	8	3.13	0.35	89						17
273117	26 EL SALVADOR	8	3.38	0.52	97						17
273118	26 EL SALVADOR	8	3.38	0.52	97						17
273119	26 EL SALVADOR	8	3.38	0.74	96						17
273120	26 EL SALVADOR	8	3.25	0.46	94						17
273121	26 EL SALVADOR	8	3.00	0.53	86						17
273122	36 GUATEMALA	8	3.13	0.99	89						17
273123	36 GUATEMALA	8	3.00	0.00	86						17
273124	36 GUATEMALA	8	2.63	0.92	76						17
273125	26 EL SALVADOR	8	3.00	0.76	87						17
273126	26 EL SALVADOR	8	3.00	0.53	87						17
273127	26 EL SALVADOR	8	2.25	0.46	65						17
273128	26 EL SALVADOR	7	3.29	0.76	104						17
273129	26 EL SALVADOR	8	3.88	0.35	124						17
273130	36 GUATEMALA	12	2.42	0.67	85						17
273131	26 EL SALVADOR	8	3.00	0.76	96						17
273132	36 GUATEMALA	8	2.88	0.35	100						17
273133	26 EL SALVADOR	8	3.38	0.52	117						17
273134	26 EL SALVADOR	8	3.25	0.46	113						17
273135	26 EL SALVADOR	8	3.13	0.83	108						17
273136	26 EL SALVADOR	8	3.00	0.76	89						17
273137	36 GUATEMALA	8	3.50	0.53	106						17
273138	36 GUATEMALA	8	3.38	0.52	101						17
273139	36 GUATEMALA	8	3.38	0.52	103						17
273140	36 GUATEMALA	8	2.75	0.46	81						17
273141	36 GUATEMALA	8	2.13	0.83	60						17
273142	36 GUATEMALA	8	3.25	0.46	94						17
273143	36 GUATEMALA	7	2.57	0.53	73						17
273144	36 GUATEMALA	11	2.27	0.90	75						17
273145	36 GUATEMALA	15	2.53	1.13	77						17
273146	36 GUATEMALA	8	2.25	0.89	72						17
273147	36 GUATEMALA	16	2.13	0.81	78						17
273148	36 GUATEMALA	8	3.00	0.93	96						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
273149	36 GUATEMALA	8	2.88	0.83	110						17
273150	36 GUATEMALA	8	2.63	0.92	100						17
273151	36 GUATEMALA	8	2.50	0.76	103						17
273152	36 GUATEMALA	8	2.63	0.74	96						17
273153	36 GUATEMALA	8	2.75	0.46	102						17
273154	36 GUATEMALA	8	2.50	0.53	96						17
273155	36 GUATEMALA	8	2.25	0.71	80						17
273156	36 GUATEMALA	8	2.63	1.06	93						17
273157	36 GUATEMALA	8	3.00	0.53	90						17
273158	26 EL SALVADOR	8	2.88	0.64	88						17
273159	26 EL SALVADOR	8	3.13	0.35	93						17
273160	26 EL SALVADOR	12	2.92	0.90	99						17
273161	26 EL SALVADOR	8	2.25	0.71	69						17
273162	26 EL SALVADOR	8	2.50	0.76	76						17
273163	26 EL SALVADOR	8	3.25	0.46	101						17
273164	26 EL SALVADOR	8	3.25	0.46	100						17
273165	26 EL SALVADOR	7	3.00	0.58	91						17
273166	26 EL SALVADOR	8	3.75	0.46	164						17
273167	36 GUATEMALA	8	2.75	0.71	111						17
273168	36 GUATEMALA	8	2.25	1.04	93						17
273174	36 GUATEMALA	8	3.25	0.71	146						17
273175	36 GUATEMALA	8	3.50	0.53	157						17
273176	36 GUATEMALA	8	3.38	0.74	150						17
273177	36 GUATEMALA	8	3.25	0.89	150						17
273178	36 GUATEMALA	16	2.81	0.83	118						17
273181	36 GUATEMALA	16	2.44	1.03	92						17
273182	36 GUATEMALA	16	2.06	0.44	75						17
273186	36 GUATEMALA	6	3.17	0.75	106						17
273188	31 GERMANY	4	2.25	0.50	100					CARO RED	17
273444	79 USA OKLAHOMA	4	2.75	0.50	122					BUSHY	17
273445	64 PHILIPPINES	11	1.73	0.90	63					NAGCARLAN	17
273446	64 PHILIPPINES	4	1.75	0.96	78					FILIPINO NO. 2	17
273447	80 USSR	3	2.67	0.58	119					OROSHAN	17
274174	51 MEXICO	4	2.50	0.58	111	7	2.57	0.53	100		12
275014	10 BULGARIA	4	2.25	0.50	90					10 X BIZON	17
275015	10 BULGARIA	4	2.50	0.58	100					KOMET X ZARIA	17
275016	10 BULGARIA	4	3.00	0.00	120					RUDZHARS X ZARIA	17
275017	10 BULGARIA	4	2.50	0.58	100					ZARIA X KOMET	17
276326	60 NORWAY	4	3.00	0.00	120					NORDERAS BUSH	17
276423	69 SOUTH AFRICA	8	2.63	0.52	117					NELCAN	17
276424	69 SOUTH AFRICA	8	2.13	0.64	96					NELMARK	17
277286	39 INDIA	8	2.25	0.89	103					EARLY SCARLET	17
279368	79 USA NEW YORK	3	2.33	0.58	100						17
279369	79 USA NEW YORK	4	2.25	0.50	96						17
279370	79 USA NEW YORK	4	3.00	0.00	129						17
279371	79 USA NEW YORK	4	3.00	0.00	129						17
279372	79 USA NEW YORK	4	2.00	0.82	86						17
279373	79 USA NEW YORK	4	2.75	0.50	118	8	2.50	1.07	98		12
279565	79 USA INDIANA	20	2.00	0.92	66					CARO RED	17
279566	79 USA TEXAS	16	2.25	1.13	77						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
279567	79 USA CONNECTICUT	4	3.50	0.58	117					PEARL HARBOR	17
279568	79 USA TEXAS	8	2.13	0.83	71	8	2.00	0.53	83		12
280060	11 CANADA	3	2.67	0.58	89					EARLY DWARF	17
280588	80 USSR	4	3.25	0.50	108					BIRINCE KUTSKIJ	17
280589	80 USSR	4	2.50	0.58	83					NOVATO	17
280590	80 USSR	4	3.50	0.58	117					ALPATJEVA	17
280591	80 USSR	4	3.25	0.50	108					ANAIT	17
280592	80 USSR	2	4.00	0.00	133					KRASNODAREC	17
280593	80 USSR	4	3.50	0.58	108					GREENTOVYJ GRIBOVSKIJ	17
280594	80 USSR	4	3.00	0.00	92					PECERSKIJ	17
280595	80 USSR	4	2.75	0.50	85					DELIKATES	17
280596	80 USSR	4	3.50	0.58	108					KARLIK	17
280597	80 USSR	4	3.00	0.00	92					MALIUTKA (SIBERIAN IN CANADA)	17
280598	80 USSR	4	2.50	0.58	77					VOSHOD	17
280599	80 USSR	4	2.50	0.58	77					DONECKIJ	17
280600	80 USSR	4	2.25	0.50	69					VOLGOGRADSKIJ	17
280601	80 USSR	4	2.75	0.50	85					KOLHOZNYJ	17
280602	80 USSR	4	2.50	0.58	83					BUKOVINSKIJ	17
280669	80 USSR	8	2.00	1.20	75					LOSENOOSTRAVISKIJ 276	17
280670	80 USSR	8	2.00	1.20	75					VEGETATIVRYI HYBRID 19	17
280671	80 USSR	8	2.63	0.92	104					SIBIRSKY SKOROPELYI 1450	17
280672	80 USSR	8	2.00	1.41	73					ALNOGOPLODNYI 40	17
280694	39 INDIA	4	3.00	0.00	100					PUSA RUBY	17
281553	45 JAPAN	4	2.50	0.58	83					FURUYA K-GO	17
281554	45 JAPAN	4	3.00	0.00	100						17
281555	45 JAPAN	4	3.00	0.00	109					KIYOSU NO. 2	17
281622	45 JAPAN	4	2.25	0.50	82					KASUGA NO. 2	17
281866	10 BULGARIA	4	3.00	0.00	109					LINIEN XXIVA	17
281867	10 BULGARIA	4	2.75	0.50	100					LINIEN XXIV-13	17
281868	10 BULGARIA	4	2.75	0.50	100						17
281869	10 BULGARIA	4	2.50	0.58	91					PLOWDIWSKA KONSERWA	17
282479	11 CANADA	3	2.67	0.58	97					VOGUE (41-A-1)	17
282960	11 CANADA	4	2.25	0.50	82					TANGGULA	17
283903	22 CZECHOSLOVAKIA	4	3.00	0.00	109						17
283904	22 CZECHOSLOVAKIA	4	3.00	0.00	100					ALPATJEVA 0905A	17
283905	22 CZECHOSLOVAKIA	4	2.75	0.50	92					AMERIKANSHER ZWERG	17
283907	22 CZECHOSLOVAKIA	4	3.25	0.50	108					CHABAROVSKIJ STAMBOVYJ	17
283908	22 CZECHOSLOVAKIA	4	3.50	0.58	117					DONECKIJ	17
283909	22 CZECHOSLOVAKIA	4	3.50	0.58	117					GRACIE	17
283910	22 CZECHOSLOVAKIA	4	3.50	0.58	117					GRACIE TORPE	17
283911	22 CZECHOSLOVAKIA	3	2.33	0.58	78					HYBRID 31	17
283912	22 CZECHOSLOVAKIA	8	2.13	0.83	71					HYBRID 31	17
283913	22 CZECHOSLOVAKIA	4	3.50	0.58	175					HYBRID 99 MNOGOLOBNYJ	17
283914	22 CZECHOSLOVAKIA	4	2.75	0.50	138					IJULSKIE	17
283915	22 CZECHOSLOVAKIA	4	2.75	0.50	138					IJULSKIE NO. 242	17
283916	22 CZECHOSLOVAKIA	4	3.00	0.00	150					JUBILEUM	17
283917	22 CZECHOSLOVAKIA	8	1.88	0.64	75					KARLIKOVYJ SION	17
283918	22 CZECHOSLOVAKIA	4	3.00	0.00	150					KARZELEK BIALY	17
283919	22 CZECHOSLOVAKIA	4	2.25	0.50	113					KARZELEK CHODOWSKI	17
283920	22 CZECHOSLOVAKIA	4	2.50	0.58	125					KARZELEK PULAWSKI	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
283921	22 CZECHOSLOVAKIA	4	2.25	0.50	113					KECSKEMETI FELMAGAS	17
283922	22 CZECHOSLOVAKIA	4	2.75	0.50	92					KECZKEMETI TORPE	17
283923	22 CZECHOSLOVAKIA	4	3.00	0.00	100					KRASNOZNAMENNYJ	17
283924	22 CZECHOSLOVAKIA	4	1.75	0.50	58					KRASNYJ DAR	17
283925	22 CZECHOSLOVAKIA	4	3.00	0.00	100					KUBAN 557	17
283926	22 CZECHOSLOVAKIA	2	2.50	0.71	83					LILIPUTCK WLADZIKOWSKI	17
283927	22 CZECHOSLOVAKIA	4	2.50	0.58	83					MANITOBA	17
283929	22 CZECHOSLOVAKIA	8	2.13	0.83	71					MICURINSKIJE 337	17
283930	22 CZECHOSLOVAKIA	4	1.50	1.29	50					MICURINSKIJE 337	17
283931	22 CZECHOSLOVAKIA	4	3.75	0.50	115					MORSKIN	17
283932	22 CZECHOSLOVAKIA	4	3.50	0.58	108					MORSKIN 12	17
283933	22 CZECHOSLOVAKIA	4	3.50	0.58	108					MORY 25	17
283934	22 CZECHOSLOVAKIA	4	3.50	0.58	108					MORY 33	17
283935	22 CZECHOSLOVAKIA	8	2.00	0.76	65					NIEDRIGE VERBESSERTE HOLLANDIS	17
283936	22 CZECHOSLOVAKIA	4	2.50	0.58	77					NIZKE PRODUKTIVNI	17
283937	22 CZECHOSLOVAKIA	4	3.00	0.00	92					PITICA EVA	17
283938	22 CZECHOSLOVAKIA	4	3.00	0.00	92					PLANOVYJ	17
283939	22 CZECHOSLOVAKIA	4	4.00	0.00	100					PLOWDIVSKA KONSERVA X BIZON	17
283940	22 CZECHOSLOVAKIA	4	4.00	0.00	100					PODAROK RODINE	17
283941	22 CZECHOSLOVAKIA	4	3.25	0.50	81					RAJCE 79	17
283942	22 CZECHOSLOVAKIA	4	4.00	0.00	100					RANNYJ ROZOVIJ	17
283943	22 CZECHOSLOVAKIA	4	3.75	0.50	94					RANNYJ VITEBSKIJ	17
283944	22 CZECHOSLOVAKIA	4	2.75	1.26	69					RESISTA	17
283945	22 CZECHOSLOVAKIA	4	3.75	0.50	94					RIZSKIE	17
283946	22 CZECHOSLOVAKIA	4	3.25	0.50	81					ROTER GNOM	17
283947	22 CZECHOSLOVAKIA	4	3.50	0.58	93					RUDLOFF	17
283948	22 CZECHOSLOVAKIA	4	4.00	0.00	107					SELF PRUNING	17
283949	22 CZECHOSLOVAKIA	4	4.00	0.00	107					SIBIRSKIJ STAMBOVYJ	17
283950	22 CZECHOSLOVAKIA	4	3.75	0.50	100					STAMBOVYJ KARLIK	17
283951	22 CZECHOSLOVAKIA	4	3.75	0.50	100					SVERCHRANNYJ B84	17
283952	22 CZECHOSLOVAKIA	4	3.75	0.50	100					THE AMATEUR	17
283953	22 CZECHOSLOVAKIA	3	3.33	0.58	89					TIRASPOLSKIJ STAMBOVIJ	17
283954	22 CZECHOSLOVAKIA	4	3.25	0.50	87					TRPASLICEK	17
283955	22 CZECHOSLOVAKIA	4	3.50	0.58	93					VERSALSKIE	17
283956	22 CZECHOSLOVAKIA	4	3.25	0.50	87					VRBICANSKE NIZKE	17
285068	64 PHILIPPINES	4	3.50	0.58	93					NAGCARLAN	17
285132	79 USA OKLAHOMA	4	4.00	0.00	107					BEARWELL	17
285133	11 CANADA	4	3.75	0.50	100					TANGGULA	17
285659	65 POLAND	4	3.00	0.00	80					AILSA CRAIG	17
285660	65 POLAND	4	3.00	0.00	80					ALL CLEAR	17
285661	65 POLAND	4	3.50	0.58	93					CARRICK	17
285662	65 POLAND	4	4.00	0.00	107					CASAQUE ROUGE	17
285663	65 POLAND	4	4.00	0.00	107					CHARKOWSKIJ	17
285664	65 POLAND	4	3.50	0.58	93					E. S. 1	17
285665	65 POLAND	4	3.50	0.58	93					E. S. 5	17
285666	65 POLAND	4	3.25	0.50	87					GRUNTOWYJ GRIBOWSKIJ	17
285667	65 POLAND	4	3.75	0.50	100					HARBINGER	17
285668	65 POLAND	4	3.00	0.00	80					IMMUN	17
285669	65 POLAND	4	4.00	0.00	107					IREGI KORAI	17
285670	65 POLAND	4	3.25	0.50	93					KESKEMETI	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
285671 65	POLAND	4	3.25	0.50	93					KRAKOWSKI WCZESNY	17
285672 65	POLAND	4	3.75	0.50	107					MAJAK	17
285673 65	POLAND	4	4.00	0.00	114					N.D.A.C.	17
285674 65	POLAND	4	3.50	0.58	100					NIEDRIGE BUSCH	17
285675 65	POLAND	4	3.00	0.00	86						17
285676 65	POLAND	4	3.00	0.00	86						17
285677 65	POLAND	4	3.00	0.82	86					OKTIABRIONOK	17
285678 65	POLAND	4	3.75	0.50	125					PERFECTA	17
285679 65	POLAND	4	3.25	0.50	108					PIERRETTE	17
285680 65	POLAND	4	3.50	0.58	117					PLANOWYJ	17
285681 65	POLAND	4	4.00	0.00	133					PLOWDIWSKA KONSERWA	17
285682 65	POLAND	4	4.00	0.00	133					PUSZKINSKIJ	17
285683 65	POLAND	4	3.50	0.58	117					RAKOWICKI	17
285684 65	POLAND	4	3.50	0.58	117					REINE DES HATIVES	17
285685 65	POLAND	4	3.50	0.58	117					SULANDIA	17
285686 65	POLAND	4	3.00	0.00	80					SINGH CROSS	17
285687 65	POLAND	4	3.00	0.00	80					SZTAMBOWYJ ALPATIEWA	17
285688 65	POLAND	4	2.75	0.50	73					WESTLANDIA	17
285689 65	POLAND	4	3.25	0.50	87					ZARIA	17
285690 65	POLAND	4	3.00	0.00	90					ZOLTOOWOCOWY 802	17
286098 59	NIGERIA	4	4.00	0.00	120					ZUARUNGU	17
286251 33	GREAT BRITAIN	4	3.75	0.50	113					AILSA CRAIG	17
286252 33	GREAT BRITAIN	4	3.75	0.50	113					HARBINGER	17
286253 33	GREAT BRITAIN	4	3.00	0.00	90					POTENTATE	17
286254 33	GREAT BRITAIN	4	3.25	0.50	97					POTENTIAL	17
286255 33	GREAT BRITAIN	4	3.75	0.50	113					MONEYMAKER	17
286256 33	GREAT BRITAIN	4	3.75	0.50	113					E. S. 1	17
286257 33	GREAT BRITAIN	4	3.75	0.50	113					E. S. 5	17
286258 33	GREAT BRITAIN	4	3.50	0.58	105					G.C.R.2	17
286259 33	GREAT BRITAIN	4	3.50	0.58	105					G.C.R.26	17
286260 33	GREAT BRITAIN	3	3.67	0.58	110					G.C.R.27	17
286261 33	GREAT BRITAIN	3	3.67	0.58	110					G.C.R.28	17
286426 53	NEPAL	3	3.00	0.00	90						17
286595 79	USA LOUISIANA	4	2.75	0.50	82					RED GLOBAL	17
286596 79	USA MINNESOTA	2	4.00	0.00	120					WISCONSIN EARLY SCARLET	17
286597 79	USA NORTH DAKOTA	3	3.33	0.58	100					SHEYENNE	17
286598 79	USA INDIANA	3	3.33	0.58	100					TECUMSEH	17
287109 11	CANADA	4	4.00	0.00	114					VANTAGE	17
288069 33	GREAT BRITAIN	4	3.75	0.50	113					OPEN AIR	17
288070 33	GREAT BRITAIN	4	3.50	0.58	105					THE AMATEUR	17
289178 38	HUNGARY	3	3.33	0.58	100					KORAI CSEMEGE	17
289179 38	HUNGARY	4	3.25	0.50	97					KECSKEMETI D 30	17
289180 38	HUNGARY	4	3.25	0.50	97					KECSKEMETI HETEROZIS	17
289181 38	HUNGARY	4	3.50	0.58	105					SOLYMARI	17
289182 38	HUNGARY	3	3.33	0.58	100					HUMBERT	17
289183 38	HUNGARY	3	3.33	0.58	100					MORZKVAI	17
289184 38	HUNGARY	4	3.25	0.50	97					CSEMEGE SZABADFOLDI	17
289185 38	HUNGARY	4	3.00	0.00	86					TUKONDI	17
289186 38	HUNGARY	4	3.50	0.58	100					KRASZNODINI 590	17
289187 38	HUNGARY	4	3.50	0.58	100					GRIBASEKI	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
289188	38 HUNGARY	4	3.75	0.50	107					SZABADFOLDI KORAI	17
289189	38 HUNGARY	4	3.00	0.82	86					DAN EXPORT	17
289190	38 HUNGARY	4	3.00	0.00	86					DELI	17
289191	38 HUNGARY	4	2.75	0.50	79					PARATLAN	17
289192	38 HUNGARY	4	3.50	0.58	100					ANAIT	17
289193	38 HUNGARY	4	3.50	0.58	100					HANISKI KORANERO	17
289194	38 HUNGARY	3	3.33	0.58	111					SAN MARZANO	17
289195	38 HUNGARY	4	3.00	0.00	100					FRUCHTAROMA	17
289196	38 HUNGARY	4	3.25	0.50	108					ZURICHER MARKT	17
289197	38 HUNGARY	3	3.33	0.58	111					WESTLANDIA	17
289198	38 HUNGARY	4	3.75	0.50	125					GOLDENE KONIGIN	17
289199	38 HUNGARY	3	3.67	0.58	122					ELSASSLAND	17
289200	38 HUNGARY	4	3.25	0.50	108					CARNOSA	17
289201	38 HUNGARY	4	3.25	0.50	108					SCHAPPIS KUSNACHTER ALPENGLUHN	17
289202	38 HUNGARY	4	2.75	0.50	92					ROTER GNOM	17
289203	38 HUNGARY	3	3.00	0.00	92					MICADO	17
289204	38 HUNGARY	4	3.25	0.96	100					CANADIENNE MENDEL	17
289205	38 HUNGARY	4	3.00	0.00	92					PIERETTE	17
289206	38 HUNGARY	4	3.00	0.00	92					SANS PAREILLE	17
289207	38 HUNGARY	3	3.00	0.00	92					SAINT PIERRE	17
289208	38 HUNGARY	3	3.00	0.00	92					SELANDIA	17
289209	38 HUNGARY	4	3.50	0.58	108					KVCKERS TROTS	17
289210	38 HUNGARY	4	3.75	0.50	115					KAMPIOEN	17
289211	38 HUNGARY	3	3.67	0.58	113					FRUHERNTE	17
289212	38 HUNGARY	4	3.25	0.50	100					PICCOLO	17
289213	38 HUNGARY	4	3.00	0.00	92					DANDERYD	17
289214	38 HUNGARY	4	3.25	0.50	100					SCANIA	17
289215	38 HUNGARY	4	3.25	0.50	100					LANDORA/50 ORIG.	17
289216	38 HUNGARY	4	3.00	0.00	92					SIRIUS	17
289217	38 HUNGARY	4	3.75	0.50	115					LINIA 71	17
289218	38 HUNGARY	4	3.50	0.58	108					AURORA DE TIGANESTI	17
289219	38 HUNGARY	4	3.50	0.58	108					DE TIGANESTI	17
289220	38 HUNGARY	4	4.00	0.00	123					KECSKEMETI 42	17
289221	38 HUNGARY	3	3.33	0.58	100					KECSKEMETI 364	17
289222	38 HUNGARY	4	3.00	0.00	90					KUBAN 557	17
289223	38 HUNGARY	4	3.75	0.50	113					IREGSZEMCSEI KORAI CSEMEGE	17
289224	38 HUNGARY	4	3.50	0.58	105						17
289225	38 HUNGARY	4	3.00	0.00	90					NUNHEINS	17
289226	38 HUNGARY	4	3.00	0.82	90						17
289227	38 HUNGARY	3	3.00	0.00	90					STANBOV ALPATYEVE	17
289228	38 HUNGARY	3	3.33	0.58	100					NYISZOYSZKY 51	17
289229	38 HUNGARY	3	2.67	0.58	80					TEXTO 2	17
289230	38 HUNGARY	4	3.00	0.00	82					BONES BATE	17
289231	38 HUNGARY	3	3.00	0.00	82					PUSKIN	17
289232	38 HUNGARY	4	3.50	0.58	95					O.P. IX	17
289233	38 HUNGARY	4	3.50	0.58	95						17
289234	38 HUNGARY	4	3.00	0.00	82					FOTI	17
289235	38 HUNGARY	4	3.25	0.50	89					FANAL	17
289236	38 HUNGARY	3	3.67	0.58	100					KECSKEMETI 33	17
289237	38 HUNGARY	4	3.50	0.58	95					KECSKEMETI 22	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
289238	38 HUNGARY	4	3.50	0.58	95					PLOVDIV 14	17
289239	38 HUNGARY	4	3.75	0.50	102					MAJAK	17
289240	38 HUNGARY	4	3.50	0.58	95					FRUHE LIEBE	17
289241	38 HUNGARY	4	4.00	0.00	109	4	3.00	0.00	120		16
289242	38 HUNGARY	4	3.75	0.50	102					KECSKEMETI 20	17
289243	38 HUNGARY	4	3.00	0.00	82					KECSKEMETI 178	17
289244	38 HUNGARY	4	3.50	0.58	95					GARFIELD ELNOK	17
289245	38 HUNGARY	4	3.00	0.00	82					KECSKEMETI 363	17
289246	38 HUNGARY	4	3.00	0.00	82					PLOVDIV 10	17
289247	38 HUNGARY	4	3.00	0.00	86					PIAC CSODAJA	17
289248	38 HUNGARY	16	2.38	1.20	73					WALTHAM SCARLET	17
289249	38 HUNGARY	4	4.00	0.00	114					HAVKOVSZKY	17
289250	38 HUNGARY	3	3.33	0.58	95					PECSOVSZKY	17
289251	38 HUNGARY	4	2.75	0.50	79					V-121	17
289252	38 HUNGARY	4	2.75	0.50	79					CROMCO	17
289253	38 HUNGARY	4	4.00	0.00	114					MEREVSZARU KARLIK	17
289254	38 HUNGARY	4	4.00	0.00	114					BEBI	17
289255	38 HUNGARY	4	2.75	0.50	79					CSERESZNYEALAKU	17
289256	38 HUNGARY	4	4.00	0.00	114					VALNORTH	17
289257	38 HUNGARY	4	2.50	0.58	71					SPERLS ZUKUNFT	17
289258	38 HUNGARY	4	3.25	0.96	93					PURPUR KONIG	17
289259	38 HUNGARY	4	2.50	0.58	71					UJ USTOKOS	17
289260	38 HUNGARY	4	2.50	0.58	71					VAHL LEADER	17
289261	38 HUNGARY	4	2.75	0.50	92					KAKI	17
289262	38 HUNGARY	4	2.50	0.58	83					REZISZTA	17
289263	38 HUNGARY	4	3.00	0.00	100					PIROS LOTHARINGIAI	17
289264	38 HUNGARY	4	2.50	0.58	83					KOKOMA	17
289265	38 HUNGARY	4	3.00	0.00	100					RUBKA	17
289266	38 HUNGARY	4	2.50	0.58	83					PAGNO	17
289267	38 HUNGARY	4	2.75	0.50	92					TERV.	17
289268	38 HUNGARY	4	2.75	0.50	92					NOVOCSERKASZKIJ	17
289269	38 HUNGARY	4	3.00	0.00	92					BIRJNESEKUTSKY	17
289270	38 HUNGARY	4	3.00	0.00	92					STEYERISCHE STAMM	17
289271	38 HUNGARY	4	2.75	0.50	85					RHEINLANDS RHUM/RAJNAI	17
289272	38 HUNGARY	4	3.00	0.00	92						17
289273	38 HUNGARY	8	2.50	0.93	73						17
289274	38 HUNGARY	4	2.75	0.50	85					GRUNSOVOJ GRUBOVSZKIJ	17
289275	38 HUNGARY	3	3.00	0.00	92					NIEDRIGE BUSCH	17
289276	38 HUNGARY	4	3.00	0.00	92					MORSE'S SPEC. 498	17
289277	38 HUNGARY	3	3.00	0.00	109					ALPATJEVA	17
289278	38 HUNGARY	4	2.50	0.58	91					ISOBILJE	17
289279	38 HUNGARY	4	2.75	0.50	100						17
289280	38 HUNGARY	4	2.00	0.82	73					BLONDKOPFCHEN	17
289281	38 HUNGARY	7	2.71	0.95	89					LINIA 15/53 TIGANESTI	17
289282	38 HUNGARY	4	3.00	0.00	109					LINIA 1622/54 LOVRIN	17
289283	38 HUNGARY	8	2.38	1.06	74					DONECKIJ 3/2-1	17
289284	38 HUNGARY	4	3.00	0.00	109					E-72	17
289285	38 HUNGARY	11	2.36	1.36	73					RECORD RUMUNII	17
289286	38 HUNGARY	4	3.00	0.00	100					BEYMES ERNTESEGEN	17
289287	38 HUNGARY	4	3.00	0.00	100					VORTREFFLICHE	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
289288	38 HUNGARY	4	3.00	0.00	100					HARZER KIND	17
289289	38 HUNGARY	7	2.86	0.90	92					GARTENFREUDE	17
289290	38 HUNGARY	4	3.25	0.50	108					DEBRECENI FURTOS	17
289291	38 HUNGARY	4	2.75	0.50	92					ZUKER KLEINFRUCHTIGE	17
289292	38 HUNGARY	4	3.00	0.00	100					VOSKOVOJ	17
289293	38 HUNGARY	3	3.00	0.00	100					SLIWKOWE	17
289294	38 HUNGARY	3	2.33	0.58	104					JULI MATADOR	17
289295	1	7	2.29	0.49	86					RECORD RUMUNII	17
289296	38 HUNGARY	4	2.75	0.50	122					PREZECZKOWE	17
289297	38 HUNGARY	4	2.25	0.96	100					WISNIOWE	17
289298	38 HUNGARY	4	2.50	0.58	111					KARZELEK PULAWSKI	17
289299	38 HUNGARY	4	2.00	0.82	89					SANTA CRUZ	17
289300	38 HUNGARY	8	2.50	0.93	93					SIEGER	17
289301	38 HUNGARY	3	3.00	0.00	100					YELLOW AILSA CRAIG	17
289302	38 HUNGARY	4	2.75	0.50	100					FICARAZZI	17
289303	38 HUNGARY	4	2.50	0.58	91					JUANE GROSSE LISSE	17
289304	38 HUNGARY	4	2.50	0.58	91					GRAF-ZEPPELIN	17
289305	38 HUNGARY	3	3.00	0.00	109					PEREMOG	17
289306	38 HUNGARY	4	3.50	0.58	117					TIGRUS KARALIS	17
289307	38 HUNGARY	4	3.00	0.00	109						17
289308	38 HUNGARY	4	2.75	0.50	92					FEUERKUGEL	17
289701	4 AUSTRALIA	4	2.25	0.50	90					COLLEGE CHALLENGER	17
289702	4 AUSTRALIA	4	2.25	0.50	90						17
289703	4 AUSTRALIA	4	2.25	0.50	90						17
289704	4 AUSTRALIA	4	2.50	0.58	100					TATURA DWARF GLOBE	17
289763	79 USA TEXAS	4	3.25	0.50	89					PINKDEAL	17
290856	79 USA TEXAS	4	2.25	0.50	90					SUMMER CHERRY	17
290857	79 USA TEXAS	8	1.75	0.89	62					PURPLE CALABASH	17
290858	79 USA TEXAS	8	2.50	0.53	90						17
290859	79 USA TEXAS	4	2.50	0.58	100					EARLY ALBERTA	17
291334	15 CHINA	4	2.00	0.82	67					CHING DAO	17
291335	15 CHINA	7	2.43	0.53	79					KPOSBOSUR	17
291336	15 CHINA	8	2.13	0.83	71					Z-PI	17
291337	15 CHINA	8	2.25	0.46	75					HONG KONG	17
291338	15 CHINA	4	2.75	0.50	92					TASAING	17
291339	15 CHINA	4	2.75	0.50	92					PIAS JONG NO. 3	17
291340	15 CHINA	4	2.50	0.58	83					DGENSHANMAI	17
291341	15 CHINA	4	2.75	0.50	92					FUENHUNG TAN THAN	17
291342	15 CHINA	4	3.00	0.00	100					PENG KUAY CHIZE	17
291343	15 CHINA	4	2.25	0.50	75					MUONGING TAO	17
291344	15 CHINA	4	2.50	0.58	83					IEZAOSHANG	17
291345	15 CHINA	4	2.50	0.58	83					FINHAY-ZAO SHENG	17
291346	15 CHINA	4	2.25	0.50	100					QIEHANG JACHEN	17
291347	15 CHINA	4	2.75	0.50	122					FAN-QUS NO. 9	17
291348	15 CHINA	4	2.75	0.50	122					HONG DAN	17
291349	15 CHINA	4	2.25	0.50	100					PAI-DUNG 249	17
291350	15 CHINA	8	2.38	0.74	89					SHAU-DUNG	17
291351	15 CHINA	8	2.25	1.04	79					PEN-QUAN NO. 7	17
291352	15 CHINA	8	2.38	1.06	83					MGU	17
291353	15 CHINA	8	2.50	0.93	89					GRIX	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
291354 15	CHINA	4	2.50	0.58	83					NAI-JANG HONG	17
291355 15	CHINA	4	2.25	0.50	75					HU-LAN-DA FEN	17
291356 15	CHINA	3	2.67	0.58	89					TIEN-MIN	17
291357 15	CHINA	4	3.00	0.00	100					U.S.S.R. 193	17
291358 15	CHINA	4	3.00	0.00	100					GENG DGON XIAO-JANG	17
291359 15	CHINA	4	2.75	0.50	92					DAHONG PAO	17
291360 15	CHINA	4	2.50	0.58	83					TAI-JUANG	17
291361 15	CHINA	4	2.75	0.50	92					PEIKING	17
292021 43	ISRAEL	4	2.75	0.50	92					DE MARMANDE IMPROVED HAZERA	17
292022 43	ISRAEL	4	2.25	0.50	75						17
292023 43	ISRAEL	4	2.75	0.50	92					MARMANDE	17
292024 43	ISRAEL	4	2.50	0.58	83					REHOVOT 13	17
292025 43	ISRAEL	7	2.57	0.53	79					TAMAR	17
293352 63	PERU	4	3.75	0.50	100					HAUNDO	17
293592 11	CANADA	4	3.25	0.50	87					CLARKE'S EARLY DOHLER #7 VR	17
293593 11	CANADA	4	3.50	0.58	93					GENEVA NO. 6 VR	17
293594 11	CANADA	3	3.67	0.58	98					EARLIEST OF ALL VR	17
293595 11	CANADA	4	3.00	0.00	80					NON-ACID VR	17
293596 11	CANADA	2	3.00	0.00	80					RED CHIEF VR	17
293597 11	CANADA	3	3.67	0.58	98					STOKESDALE #4 VR	17
293598 11	CANADA	3	3.67	0.58	98					ACE VR	17
294439 43	ISRAEL	4	2.25	0.50	75						17
294440 43	ISRAEL	3	2.33	0.58	78						17
294441 43	ISRAEL	4	2.75	0.50	92					EIN-GHEDY 13	17
294442 43	ISRAEL	4	2.75	0.50	122					GRUNTOVII BRIBOVSKII	17
294443 43	ISRAEL	4	2.50	0.58	111					KARLIK 1185	17
294444 43	ISRAEL	4	2.75	0.50	122					PEREMOGA 165	17
294445 43	ISRAEL	4	2.75	0.50	122						17
294446 43	ISRAEL	4	2.50	0.58	111						17
294447 43	ISRAEL	8	2.75	0.89	98						17
294448 43	ISRAEL	4	2.25	0.50	100						17
294449 8	BRAZIL	4	2.25	0.50	100					SANTA CRUZ	17
294450 8	BRAZIL	4	2.75	0.50	92					SANTA CRUZ	17
294638 33	GREAT BRITAIN	3	3.00	0.00	100					DEVON SURPRISE	17
296362 79	USA OKLAHOMA	4	3.50	0.58	93					SMOKY MOUNTAIN	17
296363 79	USA OKLAHOMA	4	3.50	0.58	100						17
296364 79	USA OKLAHOMA	4	3.50	0.58	100						17
296365 79	USA OKLAHOMA	3	4.00	0.00	114						17
296366 79	USA OKLAHOMA	4	3.50	0.58	100						17
296367 79	USA OKLAHOMA	4	3.25	0.96	93					DURA RED	17
296368 79	USA OKLAHOMA	4	3.25	0.50	93					M X D-2	17
296369 79	USA OKLAHOMA	3	3.67	0.58	105					LOW BUSH	17
296370 79	USA OKLAHOMA	4	3.00	0.82	86					SUMMER BEARING	17
296371 79	USA TEXAS	10	2.80	0.92	88						17
297317 69	SOUTH AFRICA	23	2.30	1.18	68						17
298602 39	INDIA	4	2.75	0.50	92					SUTTON'S BEST OF ALL	17
298633 80	USSR	4	2.50	0.58	83					PIONER 2761	17
298933 65	POLAND	8	2.00	1.20	60	3	2.33	0.58	104		9
298934 65	POLAND	6	1.67	1.03	63	4	1.00	0.82	40		14
298935 65	POLAND	4	1.50	0.58	75						14

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
298936	65 POLAND	8	1.88	0.83	75						17
298937	65 POLAND	4	1.50	0.58	75						17
298938	65 POLAND	4	2.00	0.00	100						17
298939	65 POLAND	4	2.00	0.00	100						17
298940	65 POLAND	7	2.00	1.00	71						17
298941	65 POLAND	7	2.00	0.82	75						17
298942	65 POLAND	8	1.75	0.71	69						17
298943	65 POLAND	3	2.00	0.00	100						17
298944	65 POLAND	3	2.00	0.00	100						17
302419	66 PUERTO RICO	8	2.13	0.99	81					PLATILLO	17
302420	66 PUERTO RICO	8	2.25	0.89	88					PLATILLO	17
302462	79 USA NEW YORK	8	2.38	1.30	90						17
302463	79 USA NEW YORK	4	3.00	0.00	90					EXTREME BUSH	17
303662	24 ECUADOR	8	2.25	0.89	82	8	0.25	0.46	8		12
303704	79 USA CALIFORNIA	4	4.00	0.00	107					ACE	17
303705	79 USA OHIO	4	3.75	0.50	100					ALPINE	17
303706	79 USA OHIO	4	4.00	0.00	107					ATHENS	17
303707	11 CANADA	4	3.50	0.58	93					B4	17
303708	79 USA CALIFORNIA	3	4.00	0.00	107					BURPEE'S GLORIANA	17
303709	79 USA CALIFORNIA	4	4.00	0.00	107					BURPEE'S MATCHLESS	17
303710	79 USA CALIFORNIA	4	3.75	0.50	100					BURPEE'S SUNNYBROOK EARLIANA	17
303711	79 USA CALIFORNIA	3	3.67	0.58	98					BURPEE'S TABLE TALK	17
303712	79 USA OHIO	4	4.00	0.00	107					CALAPLATA	17
303713	79 USA MICHIGAN	4	3.25	0.50	93					CARO RED	17
303714	79 USA CALIFORNIA	4	3.50	0.58	100					CAVALIER	17
303715	79 USA OHIO	3	3.67	0.58	105					CLUSTER MATO	17
303716	79 USA OHIO	4	3.25	0.50	93					COLORADO RED	17
303717	79 USA OREGON	4	3.50	0.58	100					COLORADO SPECIAL	17
303718	79 USA CALIFORNIA	4	3.25	0.50	93					CPC #2	17
303719	79 USA OHIO	3	3.33	0.58	95					CUYANO	17
303720	79 USA OHIO	4	3.75	0.50	107					DOUBLERICH	17
303721	79 USA OHIO	4	2.50	0.58	71					THE DUTCHMAN	17
303722	79 USA MICHIGAN	4	3.50	0.58	88						17
303723	79 USA MICHIGAN	4	4.00	0.00	100					EARLY CHATHAM	17
303724	79 USA OHIO	4	3.00	0.00	75					EARLY DWARF BUSH	17
303725	79 USA OHIO	4	3.00	0.00	75					EARLY DWARF RED (AUSTRALIAN)	17
303726	11 CANADA	4	3.50	0.58	88	4	0.00	0.00	0	EARLINORTH	17
303727	79 USA CALIFORNIA	4	3.50	0.58	117					EARLY PAK	17
303728	79 USA NEW YORK	3	3.00	0.00	100					EARLY RED CHEEK	17
303729	79 USA MICHIGAN	4	3.50	0.58	117					EARLY WONDER	17
303730	79 USA OHIO	4	3.00	0.00	100					EGG TOMATO	17
303731	79 USA MICHIGAN	4	3.00	0.00	100					EVERBEARING	17
303732	79 USA OHIO	3	3.00	0.00	100					EVERGREEN TOMATO	17
303733	79 USA FLORIDA	4	4.00	0.00	133					FLORALAU	17
303734	79 USA OHIO	4	3.00	0.00	100					FORTUNE	17
303735	79 USA OREGON	4	3.25	0.50	108					GILL'S ALLPURPOSE	17
303736	79 USA OHIO	3	3.00	0.00	100					GOLDEN GLOW	17
303737	79 USA OHIO	3	3.33	0.58	111					GOSSE LISSE	17
303738	79 USA CALIFORNIA	4	3.25	0.50	108					GRAND PAK	17
303739	79 USA CALIFORNIA	2	3.50	0.71	117					IMPERIAL	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
303740	79 USA MICHIGAN	4	3.00	0.00	100					IMP. COLOSSAL CRIMSON	17
303742	79 USA MICHIGAN	4	3.50	0.58	117					IMP. COLOSSAL RED	17
303743	79 USA MICHIGAN	4	3.00	0.00	100					IMP. COLOSSAL YELLOW	17
303744	79 USA OREGON	4	3.00	0.00	100					IMP. PEPPER	17
303745	79 USA MICHIGAN	4	3.25	0.50	108					INDIAN RIVER	17
303746	79 USA MICHIGAN	4	2.50	0.58	83					ITALIAN CANNER	17
303747	79 USA OHIO	2	2.50	0.71	83					JUBILEE GOLDEN ORANGE	17
303748	79 USA NEW JERSEY	4	3.00	0.00	100					K.C. 135	17
303749	79 USA NEW JERSEY	4	3.00	0.00	100					K.C. 146	17
303750	79 USA COLORADO	4	3.50	0.58	117					KENOSHA	17
303751	79 USA OHIO	4	3.25	0.50	108					KOHAMO	17
303752	79 USA MICHIGAN	4	3.00	0.00	100					KOPIAH	17
303753	79 USA OHIO	4	3.00	0.00	100					LAKETA	17
303754	79 USA OHIO	4	3.00	0.00	100					LANGADA	17
303755	79 USA MICHIGAN	4	3.00	0.00	86					LEMON	17
303756	79 USA MICHIGAN	3	3.00	0.00	86					LOUISIANA ALL SEASON	17
303757	79 USA OHIO	3	4.00	0.00	114					LUTESCENT	17
303758	79 USA MICHIGAN	4	3.25	0.50	93					MAMMOUTH WONDER	17
303759	79 USA MICHIGAN	4	3.00	0.00	86					MANALEE	17
303760	79 USA OHIO	3	3.00	1.00	86					MARKET FAVORITE	17
303761	79 USA OHIO	3	3.00	0.00	86					MARKET SUPREME	17
303762	79 USA OHIO	4	3.50	0.58	100					MARMANDE	17
303763	79 USA OHIO	4	3.25	0.50	93					MARMAN WORLD'S EARLIEST	17
303764	44 ITALY	4	3.00	0.00	100					MARMANDE REGULAR	17
303765	44 ITALY	4	3.00	0.00	100					MARMANDE VERT. RESIST.	17
303766	79 USA OHIO	4	3.00	0.00	100					MENDOZA 44	17
303767	79 USA CALIFORNIA	4	3.00	0.00	100					METEOR	17
303768	79 USA OHIO	4	3.00	0.00	100					MISSION DYKE	17
303769	11 CANADA	4	3.00	0.00	100					MUSTANG	17
303770	79 USA OHIO	4	2.75	0.50	92					NECTARINE	17
303771	79 USA UTAH	4	2.50	0.58	83						17
303772	79 USA IDAHO	4	2.50	0.58	83					OWYHEE	17
303773	79 USA IDAHO	4	3.25	0.50	108					PAYETTE	17
303774	79 USA OHIO	4	2.50	0.58	100					PERON	17
303775	79 USA OHIO	4	2.75	0.50	110					PINK SAN MARZANO	17
303776	79 USA OHIO	12	2.25	0.87	80					PLAMAR	17
303777	79 USA OHIO	4	3.00	0.00	120					PREMIER	17
303778	79 USA OHIO	4	3.75	0.50	150					PROTRUDING CARPELS (ORCHIDS)	17
303779	79 USA OHIO	4	3.25	0.50	130					PUCK - OHIO 4278	17
303780	79 USA CALIFORNIA	4	3.00	0.00	120					RED CLOUD	17
303781	68 SCOTLAND	4	3.00	0.00	120					RED TOMATO	17
303782	79 USA CALIFORNIA	4	3.50	0.58	93					RED TOP	17
303783	79 USA OHIO	4	3.50	0.58	93					RED TOP	17
303784	79 USA TEXAS	4	3.00	0.00	80					RIO GRANDE	17
303785	79 USA OHIO	4	3.00	0.82	80					RUFFLED TOMATO	17
303786	79 USA OHIO	4	3.25	0.50	87					SAN MARZANO	17
303787	79 USA OHIO	4	3.00	0.00	80					SANTA CARALINA	17
303788	79 USA OREGON	4	3.00	0.00	80					SEATTLE BEST OF ALL	17
303789	79 USA CALIFORNIA	4	3.00	0.00	80					SEQUOIA	17
303790	79 USA OHIO	4	2.25	0.96	82					STENNER'S EXHIBITION	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
303791	79 USA OHIO	4	2.50	0.58	91					SUMMER PROLIFIC	17
303792	79 USA OHIO	4	2.50	0.58	91					TATINTER	17
303793	79 USA OHIO	4	2.25	0.50	82					TATURA	17
303794	79 USA OHIO	4	3.00	0.00	109					TEXTOL W-7	17
303795	79 USA OHIO	4	3.00	0.00	109					THESSALONIKI	17
303796	79 USA OHIO	4	2.50	0.58	91					THICK SEPAL	17
303797	79 USA OHIO	4	3.25	0.50	118					TINY TIM	17
303798	79 USA OHIO	4	3.25	0.50	108					TOMANGO	17
303799	79 USA MICHIGAN	4	2.50	0.58	83					TRIP L CROP CLIMBING	17
303800	79 USA UTAH	4	3.00	0.00	100					UTAH 13	17
303801	79 USA UTAH	8	2.75	0.89	92					PERU WILD	17
303802	79 USA UTAH	4	3.00	0.00	100						17
303803	79 USA UTAH	4	2.75	0.50	92						17
303804	79 USA UTAH	4	3.00	0.00	100						17
303805	79 USA OHIO	4	2.75	0.50	92					VOKAL	17
303806	79 USA UTAH	4	2.50	0.58	100					MOSCOW VR	17
303807	79 USA OHIO	3	2.33	0.58	93					WHEATLEY	17
303808	79 USA MICHIGAN	8	2.00	0.76	84					WILT MASTER	17
303809	79 USA MICHIGAN	4	2.75	0.50	110					WISCONSIN 55	17
303810	79 USA CALIFORNIA	6	1.67	0.82	70					YELLOW PEAR	17
303811	79 USA CALIFORNIA	7	1.71	0.95	68					YELLOW PLUM	17
303812	68 SCOTLAND	4	2.75	0.50	110					YELLOW TOMATO	17
303813	79 USA CALIFORNIA	8	2.00	0.93	84	4	3.00	0.00	120	RED CHERRY	16
303814	79 USA IDAHO	12	1.75	0.62	76	4	0.00	0.00	0		9
304224	79 USA NEW YORK	7	2.29	1.25	74						17
304225	79 USA NEW YORK	4	2.00	0.82	114					MCMULLEN ROSE	17
304226	79 USA NEW YORK	3	2.33	0.58	133					MORY 33	17
304227	79 USA NEW YORK	4	2.75	0.50	157					KARZELEK PULAWSKI	17
304228	79 USA NEW YORK	7	2.57	1.40	103					TIDLING BUSH	17
304229	79 USA NEW YORK	8	2.00	0.76	80					STUPICKE POLNI	17
304230	79 USA NEW YORK	4	2.00	0.00	114					WEBB SPECIAL	17
304232	79 USA NEW YORK	8	2.25	0.89	88						17
304233	79 USA NEW YORK	4	2.00	0.00	114						17
304234	79 USA NEW YORK	4	2.00	0.82	114						17
304235	79 USA NEW YORK	4	1.50	0.58	86						17
304236	79 USA NEW YORK	8	2.13	0.99	76						17
304237	79 USA NEW YORK	4	2.00	0.82	114						17
304238	79 USA NEW YORK	4	2.50	0.58	143						17
304239	79 USA NEW YORK	4	2.50	0.58	143						17
304240	79 USA NEW YORK	4	2.00	0.82	114						17
304241	79 USA NEW YORK	4	1.50	0.58	86						17
304242	79 USA NEW YORK	4	2.75	0.50	122						17
304243	79 USA NEW YORK	4	2.25	0.50	100						17
304244	79 USA NEW YORK	4	2.50	0.58	111						17
304245	79 USA NEW YORK	4	3.00	0.00	133					WHEATLEY-ONE-O-ONE	17
304246	79 USA NEW YORK	8	2.38	1.30	74					AKADEMIK F2	17
304247	79 USA NEW YORK	4	2.50	0.58	111					TRIUMF F1	17
304248	79 USA NEW YORK	8	2.38	1.30	74					IMMUN PRIOR	17
304249	79 USA NEW YORK	7	2.14	1.21	72					HARDIN'S MINIATURE	17
304250	79 USA NEW YORK	4	2.00	0.00	120					MONTREAL 61	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
304251	79 USA NEW YORK	4	2.00	0.82	120	4	1.25	1.26	45	LOOMIS POTATO LEAF CHERRY	16
304252	79 USA NEW YORK	8	2.00	1.41	66					CEREZH	17
304253	79 USA NEW YORK	4	1.75	0.50	105					PAUL BUNYAN	17
306137	32 GHANA	4	2.50	0.58	150						17
306138	32 GHANA	8	2.38	1.51	80					ZUARUNGU IMPROVED	17
306139	32 GHANA	8	2.38	1.60	80					ZUARUNGU IMPROVED	17
306140	32 GHANA	4	2.50	0.58	150						17
306210	39 INDIA	4	1.50	0.58	67						17
306211	3 ARGENTINA	4	2.00	0.82	89					BLAIR FORCING	17
306212	3 ARGENTINA	4	2.00	0.00	89					EL NARO	17
306213	3 ARGENTINA	8	2.63	1.51	81					FIRESTEEL	17
306214	3 ARGENTINA	8	2.63	1.30	87					GRANDE PERFEICAO	17
306215	3 ARGENTINA	8	2.00	0.93	67					MAGNIF POTENTE	17
306216	3 ARGENTINA	4	1.25	0.96	56	8	0.00	0.00	0		12
306811	79 USA OHIO	4	2.25	0.50	150	4	0.25	0.50	11		9
306813	79 USA OHIO					3	0.00	0.00	0		14
306814	79 USA OHIO	2	3.00	0.00	200	3	0.00	0.00	0		14
308182	63 PERU	8	1.88	1.55	58	4	0.00	0.00	0		7
308183	63 PERU	4	1.75	0.50	78	4	3.00	0.00	120		6
309664	79 USA MICHIGAN	8	2.38	1.19	80					ODESSA	17
309665	79 USA MISSOURI	4	1.75	0.50	78					TOMBOY	17
309666	79 USA INDIANA	8	2.00	1.41	63					EPOCH	17
309667	79 USA INDIANA	4	2.00	0.82	89					STAIR	17
309668	79 USA SOUTH CAROLINA	8	2.00	1.51	63					MARION	17
309669	79 USA FLORIDA	4	2.25	0.96	100					MANAPAL	17
309670	79 USA MICHIGAN	4	1.75	0.96	78					SPARTAN RED 8	17
309671	79 USA OHIO	3	2.67	0.58	133					LIBBY C-52	17
309672	79 USA TEXAS	8	2.25	0.89	80					HOTSET	17
309673	79 USA TEXAS	8	2.00	1.07	68						17
309674	79 USA TEXAS	4	2.25	0.50	113						17
309675	79 USA TEXAS	4	2.25	0.50	113					HARDIN'S MINIATURE TOMATO (FLO	17
309676	79 USA TEXAS	4	2.50	0.58	125						17
309677	79 USA TEXAS	7	2.43	1.51	72						17
309678	79 USA TEXAS	4	2.00	0.82	100						17
309679	79 USA TEXAS	8	2.63	1.30	88						2
309688	51 MEXICO	7	2.57	1.40	91						17
309689	51 MEXICO	4	2.50	0.58	125						17
309690	51 MEXICO	4	2.00	0.00	100						17
309691	51 MEXICO	8	2.50	1.60	78						17
309692	51 MEXICO	8	2.13	1.36	68						17
309693	51 MEXICO	8	2.25	1.39	72						17
309815	20 COSTA RICA	8	2.25	0.89	77	4	3.00	0.00	109		16
309890	36 GUATEMALA	4	1.75	0.50	88						17
309891	36 GUATEMALA	8	2.00	0.76	71						17
309892	36 GUATEMALA	4	2.00	0.00	100						17
309893	36 GUATEMALA	8	2.13	0.99	81						17
309894	36 GUATEMALA	4	2.00	0.82	100						17
309895	36 GUATEMALA	4	1.75	0.50	88						17
309896	36 GUATEMALA	16	2.50	0.73	88						17
309897	36 GUATEMALA	4	1.75	0.50	88						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
309898	36 GUATEMALA	4	1.75	0.96	100						17
309899	36 GUATEMALA	8	2.13	0.99	76						17
309900	36 GUATEMALA	8	2.50	1.20	90						17
309901	36 GUATEMALA	4	2.00	0.00	114						17
309902	36 GUATEMALA	4	2.00	0.00	114						17
309903	36 GUATEMALA	8	2.50	1.20	90						17
309904	36 GUATEMALA	4	1.25	0.96	71						17
309905	36 GUATEMALA	7	1.86	0.69	74						17
309906	36 GUATEMALA	8	1.88	0.99	57						17
309907	36 GUATEMALA	4	2.00	0.82	80	8	2.13	0.99	92		12
309908	36 GUATEMALA	8	2.13	0.99	68					CHIBE DE IPALA	17
309909	36 GUATEMALA	8	1.75	1.39	53						17
309910	36 GUATEMALA	4	2.25	0.50	90						17
309911	36 GUATEMALA	4	1.75	0.50	70						17
309912	36 GUATEMALA	4	2.00	0.00	80						17
309913	36 GUATEMALA	4	2.50	0.58	100						17
309914	36 GUATEMALA	4	2.00	0.00	80						17
309915	36 GUATEMALA	4	2.00	0.00	80						17
309916	36 GUATEMALA	4	1.75	0.50	70						17
309917	36 GUATEMALA	4	2.75	0.50	110						17
309918	36 GUATEMALA	4	2.00	0.00	80						17
309919	36 GUATEMALA	4	2.00	0.00	80						17
309920	36 GUATEMALA	4	2.00	0.00	80						17
309921	36 GUATEMALA	4	2.00	0.00	80						17
311109	36 GUATEMALA	4	1.75	0.50	100						17
311110	36 GUATEMALA	4	1.75	0.50	100						17
311111	36 GUATEMALA	8	2.00	1.51	68						17
311115	51 MEXICO	4	1.25	0.96	71						17
311116	51 MEXICO	4	2.25	0.50	129						17
311117	51 MEXICO	4	2.25	0.50	129						17
311118	51 MEXICO	4	2.00	0.82	114						17
311279	51 MEXICO	4	2.25	0.50	129						17
312131	36 GUATEMALA	4	3.00	0.00	133						17
312181	51 MEXICO	4	2.00	0.82	89						17
312182	51 MEXICO	4	1.75	0.50	78						17
312183	51 MEXICO	4	1.75	0.50	78						17
312184	51 MEXICO	4	2.00	0.00	89						17
312185	51 MEXICO	4	1.75	0.50	78						17
312186	51 MEXICO	3	1.67	0.58	74						17
312187	51 MEXICO	4	2.00	0.00	89						17
312188	51 MEXICO	4	3.00	0.00	92						17
312189	51 MEXICO	4	2.50	0.58	77						17
312190	51 MEXICO	4	4.00	0.00	123						17
312191	51 MEXICO	4	3.50	0.58	108						17
312426	37 HONDURAS	4	2.50	0.58	77	4	3.00	0.00	109		16
313943	63 PERU	4	3.25	0.50	100	8	2.00	0.00	100		12
316636	65 POLAND	3	3.33	0.58	103						17
317892	80 USSR	4	3.00	0.00	92					EARLY MATURING SIBERIAN	17
318507	32 GHANA	3	2.67	0.58	76					IMPROVED ZUARUNGU	17
319368	51 MEXICO	4	3.25	0.50	93	4	2.75	0.50	100		16

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
319369	51 MEXICO	4	4.00	0.00	114	4	3.00	0.00	109		16
319695	29 FRANCE	4	3.25	0.50	93					RONITA	17
319893	4 AUSTRALIA	8	2.00	0.76	60					BURWOOD WONDER	17
319894	4 AUSTRALIA	8	2.13	0.99	64					TATINTER	17
319895	4 AUSTRALIA	12	2.08	1.31	71	4	2.75	0.50	92	VICTORIAN DWARF NO. 1	17
320198	12 CANARY ISLANDS	4	2.75	0.50	79					ESPECIAL	17
320468	69 SOUTH AFRICA	4	3.75	0.50	107						17
320469	69 SOUTH AFRICA	4	4.00	0.00	114						17
320470	69 SOUTH AFRICA	4	3.50	0.58	100						17
321015	17 CHINA, TAIWAN	4	4.00	0.00	114					FENGSHAN # 51	17
321016	17 CHINA, TAIWAN	4	3.25	0.50	93					PERSIMMON TYPE	17
321026	80 USSR	4	3.50	0.58	100					ANAIT	17
321027	80 USSR	4	3.75	0.50	107					BUDENOVKA	17
321028	27 ENGLAND	2	3.00	0.00	86					BABY LEA	17
321029	31 GERMANY	4	3.50	0.58	100					MAGNUM BONUM	17
321030	31 GERMANY	4	3.75	0.50	107					PIERETTE	17
321031	31 GERMANY	4	2.75	0.50	79					PERFECTION	17
321032	31 GERMANY	4	3.50	0.58	100					RESISTA	17
321033	31 GERMANY	4	3.00	0.00	86					PIERETTE	17
321056	79 USA NEW YORK	4	3.25	0.50	93					CONSERVA 1010	17
321057	79 USA NEW YORK	2	3.50	0.71	100					EASTERN STATES 24	17
321058	79 USA NEW YORK	4	3.75	0.50	107					SUMMER SUNRISE	17
321059	79 USA NEW YORK	4	4.00	0.00	133					RHODE ISLAND EARLY	17
321062	79 USA NEW YORK	4	4.00	0.00	133					KLEIN EARLY	17
321063	79 USA NEW YORK	3	3.33	0.58	111					ROSY RED	17
321064	38 HUNGARY	4	4.00	0.00	133					KECSKEMETI 363	17
321065	4 AUSTRALIA	3	3.00	0.00	100					SOUTH AUSTRALIA DWARF RED	17
321066	11 CANADA	8	3.00	0.76	96					VINE RED	17
321067	79 USA NEW YORK	3	4.00	0.00	133					WEBB SPECIAL	17
321068	4 AUSTRALIA	4	3.75	0.50	125					QUEENSLAND 3 OR Q3	17
321069	79 USA NEW YORK	4	3.50	0.58	100					NOVCERKASSKIJ 416	17
321070	79 USA NEW YORK	4	3.25	0.50	93					MICANDO	17
321749	39 INDIA	3	3.33	0.58	95					RED CHERRY	17
323320	39 INDIA	4	4.00	0.00	114						17
323510	39 INDIA	3	3.33	0.58	95						17
324065	64 PHILIPPINES	4	3.00	0.00	86					NAGCARLAN, STRAIN 1	17
324306	32 GHANA	4	3.00	0.00	86					MAUI	17
324307	32 GHANA	8	2.00	1.20	93						17
324707	10 BULGARIA	12	1.67	1.30	58						17
324708	10 BULGARIA	7	1.71	1.60	81						17
325134	11 CANADA	4	3.50	0.58	117					EARLY LETHBRIDGE	17
325135	11 CANADA	4	2.50	0.58	83					EARLICROP	17
325136	11 CANADA	4	3.00	0.00	100					RED BOBS	17
325137	11 CANADA	4	3.75	0.50	100					GLOBETROTTER	17
325138	11 CANADA	4	3.50	0.58	93					KRASNJDAR 590	17
325139	11 CANADA	4	3.00	0.00	80					SOVETSKIJ 679	17
325140	80 USSR	3	3.00	0.00	80					RYBKA 52	17
325141	80 USSR	3	3.33	0.58	89					PECERSKIJ 278	17
325142	80 USSR	4	4.00	0.00	107					RANNIJ VISSERSKIJ 1880	17
325143	80 USSR	4	3.50	0.58	93					HARBAROVSKIJ 131	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
325144	80 USSR	4	3.50	0.58	93					AHTABINSKIJ 85	17
325145	80 USSR	3	3.00	0.00	133					NOVCERKASSKIJ 416	17
325146	79 USA TEXAS	4	2.75	0.50	122					YOUNG	17
325147	79 USA WEST VIRGINIA	3	3.00	0.00	133					CENTENNIAL	17
325148	79 USA NSSL	4	3.50	0.58	156	4	3.00	0.00	109		16
325149	79 USA NSSL	4	3.00	0.00	133					CISCO	17
325150	79 USA NSSL	4	2.50	0.58	111					FREESTATE	17
325151	79 USA NSSL	4	2.75	0.50	122						17
325152	79 USA NSSL	4	3.00	0.00	133					GARLAND	17
325153	79 USA NSSL	4	3.50	0.58	100					LA VICTORE DE DERY	17
325154	79 USA NSSL	4	3.00	0.00	86					UEBERREICH	17
325155	79 USA NSSL	4	3.00	0.00	86					VENTURA	17
325879	64 PHILIPPINES	4	3.00	0.00	86					GAPAN NATIVE	17
325880	64 PHILIPPINES	4	3.25	0.50	93					IMPROVED HARBOT	17
325881	64 PHILIPPINES	4	3.75	0.50	107	4	3.00	0.00	100	SUSONG KALABAW	16
325882	64 PHILIPPINES	4	3.50	0.58	100					TALAVERA NATIVE	17
325921	69 SOUTH AFRICA	4	3.25	0.50	93					HOMESTEAD TUINBOU	17
325922	69 SOUTH AFRICA	4	3.25	0.50	108					RED KAKI	17
325923	69 SOUTH AFRICA	4	3.25	0.50	108					ROODE PLAAT PREMIER	17
326168	69 SOUTH AFRICA	4	3.00	0.00	100					DURBAT	17
326169	17 CHINA, TAIWAN	4	4.00	0.00	133					FENGSHAN #1	17
326170	17 CHINA, TAIWAN	4	3.25	0.50	108					PERSIMMON TYPE	17
326171	69 SOUTH AFRICA	4	3.50	0.58	117					ROODE PLAAT PREMIER	17
326172	69 SOUTH AFRICA	4	2.50	0.58	83					SUNNEVA	17
326173	70 SOUTH AMERICA	4	4.00	0.00	133						9
326193	51 MEXICO	4	3.50	0.58	88						17
326428	79 USA SOUTH CAROLINA	4	4.00	0.00	100					SPARTANBURG CLIMBING	17
326429	80 USSR	4	4.00	0.00	100					JUZANIN 1644	17
326430	79 USA NSSL	3	4.00	0.00	100					THE FRUIT	17
330328	79 USA MARYLAND	6	2.33	0.52	67					BONITA OJO	17
330329	51 MEXICO	3	3.00	0.00	75					COTAXTLA 1	17
330330	79 USA MARYLAND	4	3.00	0.00	75					CULIACAN 1	17
330331	79 USA MARYLAND	4	2.75	0.50	69					DANSK EXPORT	17
330332	79 USA MARYLAND	4	3.75	0.50	125					DWARF GEM	17
330333	31 GERMANY	4	2.75	0.50	92					GROSSE FLEISCH	17
330334	27 ENGLAND	4	3.00	0.00	100					HUNDREDFOLD	17
330335	72 SWEDEN	4	2.50	0.58	83					JULIA HG	17
330336	45 JAPAN	4	3.75	0.50	125					KURIHARA	17
330337	79 USA MARYLAND	4	3.75	0.50	125					LUTESCENT TOMATO	17
330338	27 ENGLAND	4	2.50	0.58	83					MELVILLE CASTLE	17
330340	72 SWEDEN	4	3.00	0.00	100					POTENTAT 11	17
330342	4 AUSTRALIA	4	3.25	0.50	108					QUEENSLAND 2 OR Q2	17
330343	4 AUSTRALIA	4	2.75	0.50	92					TATINTER DWARF	17
330627	32 GHANA	4	3.00	0.00	100					MOLOKAI	17
330725	79 USA TEXAS	4	3.25	0.50	108					STICK TOMATO	17
330726	79 USA NORTH CAROLINA	4	3.00	0.00	100					BULGARIA #3	17
330727	79 USA NORTH CAROLINA	8	2.13	1.36	104	4	2.75	0.50	92	HEINZ H 2990	17
330956	18 COLOMBIA	4	2.75	0.50	92						17
338239	11 CANADA	4	3.00	0.00	100					IMPROVED MEERUTI	17
338240	11 CANADA	4	3.50	0.58	117					UNIFORM RIPENING MEERUTI X 13	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
338241	11 CANADA	4	3.00	0.00	100					UNIFORM RIPENING MEERUTI X 13	17
338492	10 BULGARIA	8	3.25	0.89	103					BALKAN	17
338493	10 BULGARIA	3	3.00	0.00	100					DRUSHBA	17
338494	10 BULGARIA	3	3.00	0.00	100					PIONEER 1	17
338495	10 BULGARIA	4	3.00	0.00	100					PIONEER 2	17
338496	10 BULGARIA	3	3.33	0.58	111					VITOSHA	17
339323	77 TURKEY	4	3.00	0.00	100						17
339324	77 TURKEY	4	3.25	0.50	87						17
339325	77 TURKEY	4	3.50	0.58	93						17
339326	77 TURKEY	4	3.25	0.50	87						17
339327	77 TURKEY	3	3.67	0.58	98						17
339328	77 TURKEY	4	3.75	0.50	100						17
339329	77 TURKEY	4	3.50	0.58	93						17
339330	77 TURKEY	4	3.25	0.50	87						17
339331	77 TURKEY	4	3.50	0.58	93						17
339332	77 TURKEY	3	4.00	0.00	100						17
339333	77 TURKEY	4	3.50	0.58	88						17
339334	77 TURKEY	4	3.50	0.58	88						17
339335	77 TURKEY	4	4.00	0.00	100						17
339336	77 TURKEY	4	3.75	0.50	94						17
339337	77 TURKEY	4	2.75	0.50	69					EDREMIT	17
339338	77 TURKEY	4	3.25	0.50	81						17
339339	77 TURKEY	4	3.50	0.58	88						17
339340	77 TURKEY	4	3.00	0.00	86						17
339882	11 CANADA	4	3.25	0.50	93	4	3.00	0.00	100		16
339883	11 CANADA	8	2.75	0.46	82	4	3.00	0.00	100		16
339910	79 USA MARYLAND	4	3.00	0.00	86					BOWEN RED	17
339911	79 USA MARYLAND	4	3.00	0.00	86					BURNLEY FORTUNE	17
339912	79 USA MARYLAND	8	3.13	0.83	93					QUEENSLAND 3 OR Q3	17
339913	79 USA MARYLAND	8	3.13	0.83	93					ARMSTRONG W 217	17
339914	79 USA MARYLAND	4	2.75	0.50	79	4	3.00	0.00	100	COLDSET	17
339915	79 USA MARYLAND	4	2.75	0.50	85					EARLY HIGH CRIMSON	17
339916	79 USA MARYLAND	4	2.75	0.50	85					PINK VOGUE	17
339917	79 USA MARYLAND	4	3.00	0.00	92					SUGAWARA	17
339918	79 USA MARYLAND	4	3.00	0.00	92					VENTURE	17
339919	79 USA MARYLAND	4	3.00	0.00	92					ANTIMOLD	17
339920	79 USA MARYLAND	4	3.25	0.50	100						17
339921	79 USA MARYLAND	4	3.25	0.50	100					GOLDEN DAWN	17
339922	79 USA MARYLAND	4	3.50	0.58	108					STONER'S A1	17
339923	79 USA MARYLAND	4	3.25	0.50	100					STABTOMATE HELLFRUCHT NO. 190	17
339924	79 USA MARYLAND	4	2.50	0.58	77					FLORENTINO	17
339925	79 USA MARYLAND	4	3.25	0.50	100					GLOROSO BPF	17
339926	79 USA MARYLAND	4	3.00	0.00	92					MARMANDE SUPER PRISNIZIA N-10	17
339927	79 USA MARYLAND	4	3.75	0.50	115					THE MIRACLE BPF	17
339928	79 USA MARYLAND	4	3.25	0.50	100					BEAUTY	17
339929	79 USA MARYLAND	4	3.00	0.00	92					HOMESTEAD FR. 761	17
339930	79 USA MARYLAND	4	3.50	0.58	108					MARVEL	17
339931	79 USA MARYLAND	4	2.75	0.50	85					CEREZA (DE COLGAR)	17
339932	79 USA MARYLAND	4	3.00	0.00	92					LAVAL	17
339933	79 USA MARYLAND	4	2.75	0.50	85					MONTSAERRAT	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
339934	79 USA MARYLAND	4	2.75	0.50	85					PALO SANTO DE INGLATERRA	17
339935	79 USA MARYLAND	4	3.25	0.50	100					POMENTA TARDIO	17
339936	79 USA MARYLAND	3	3.33	0.58	103					POMETA VALENCIA	17
339937	79 USA MARYLAND	4	2.75	0.50	85					SAN PEDRO	17
339938	79 USA MARYLAND	4	3.00	0.00	92					TRES CANTOS	17
339939	79 USA MARYLAND	4	3.50	0.58	117					CENTURY	17
339940	79 USA MARYLAND	4	2.75	0.50	92					CHALKS EARLY JEWELL	17
339941	79 USA MARYLAND	4	3.00	0.00	100					DWARF STONE	17
339942	79 USA MARYLAND	4	3.00	0.00	100					GENEVA II	17
339943	79 USA MARYLAND	4	3.50	0.58	117					GOLDEN DWARF CHAMPION	17
339944	79 USA MARYLAND	4	3.75	0.50	125					TRUCKERS FAVORITE	17
340905	79 USA TEXAS	8	2.00	1.20	100	12	0.00	0.00	0	CERVENA KAPHA	12
340906	79 USA TEXAS	4	3.50	0.58	117					SUMMER CHERRY	17
340907	79 USA TEXAS	4	2.75	0.50	85						17
340908	79 USA TEXAS	4	3.00	0.00	92						17
340909	79 USA TEXAS	4	2.50	0.58	77						17
341124	79 USA MARYLAND	3	3.00	0.00	92					CHICO GRANDE	17
341125	79 USA MARYLAND	4	3.25	0.50	100					DELSHER	17
341126	79 USA MARYLAND	4	2.75	0.50	85					GIANT ITALIAN	17
341127	79 USA MARYLAND	4	2.50	0.58	77					LA BONITA	17
341128	79 USA MARYLAND	4	2.75	0.50	85					NEMARED	17
341129	79 USA MARYLAND	4	2.50	0.58	75					CAMPBELL 19	17
341130	79 USA MARYLAND	4	3.50	0.58	105					CAMPBELL 22	17
341131	79 USA MARYLAND	4	3.00	0.00	100					CAMPBELL 24	17
341132	79 USA MARYLAND	4	2.50	0.58	83					CAMPBELL 1327	17
341133	79 USA MARYLAND	4	2.75	0.50	92					HEINZ 1350	17
341134	79 USA MARYLAND	4	2.75	0.50	92					HEINZ 1370	17
341135	79 USA MARYLAND	7	2.57	0.98	81					HEINZ 1409	17
341136	79 USA MARYLAND	4	2.75	0.50	92					HEINZ 1417	17
341137	79 USA MARYLAND	4	2.25	0.50	75					HEINZ 1439	17
341138	79 USA MARYLAND	4	3.25	0.50	108					HEINZ 1538 VF	17
341139	79 USA MARYLAND	3	3.00	0.00	92					HEINZ 1548 VF	17
341140	79 USA MARYLAND	4	2.75	0.50	85					HEINZ 1630 VF	17
341141	79 USA MARYLAND	4	3.25	0.50	100					VF-N-8	17
341142	79 USA MARYLAND	4	3.00	0.00	92					VF 13-L	17
341143	79 USA MARYLAND	4	3.25	0.50	100					VF 13-L-34	17
341144	79 USA MARYLAND	4	3.25	0.50	100					VF 145A	17
341145	79 USA MARYLAND	4	3.50	0.58	108					VF 145B	17
341146	79 USA MARYLAND	2	3.00	0.00	92					VF 145-B7	17
341147	79 USA MARYLAND	4	3.00	0.00	100					VF 145-B8	17
341148	79 USA MARYLAND	4	3.25	0.50	108					VF 145-B-7879	17
341149	79 USA MARYLAND	3	3.33	0.58	111					VF 145-E	17
341150	79 USA MARYLAND	4	2.75	0.50	92					VF 145-F5	17
341151	79 USA MARYLAND	3	2.67	0.58	89					VF 145-GUS	17
341152	79 USA MARYLAND	3	3.00	0.00	100					VF 145-MACH-9	17
341153	79 USA MARYLAND	4	3.00	0.00	100					VF 145-MACH-14	17
341154	79 USA MARYLAND	4	3.00	0.00	100					VF 145-21-4	17
341155	79 USA MARYLAND	4	2.50	0.58	91					VF 145-31-4P	17
341156	79 USA MARYLAND	4	3.00	0.00	109					VF 145-22-8	17
341982	24 ECUADOR	4	2.50	0.58	91	4	1.75	0.50	58		16

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
341983	79 USA CALIFORNIA	3	2.67	0.58	97	8	2.13	0.99	92		12
341984	79 USA RHODE ISLAND	4	2.50	0.58	91					URI 67-15-1	17
341985	79 USA RHODE ISLAND	3	2.67	0.58	97					URI 67-17-1	17
341986	79 USA RHODE ISLAND	4	2.75	0.50	100					URI 67-18-1	17
341987	79 USA RHODE ISLAND	4	3.00	0.00	109					URI 67-26-1	17
341988	79 USA RHODE ISLAND	6	2.67	1.21	86					URI 67-52-1	17
341989	79 USA RHODE ISLAND	4	3.00	0.00	120					URI 67-61-1M	17
343059	69 SOUTH AFRICA	4	2.25	0.50	90						17
343828	11 CANADA	4	3.00	0.00	120					BELLEVUE BUSK	17
344102	79 USA UTAH	8	2.00	1.07	125	12	0.08	0.29	3	RED CURRANT 1149 K	12
344103	79 USA UTAH	4	2.00	0.00	80	8	0.00	0.00	0		12
344371	77 TURKEY	3	2.67	0.58	107					EDREMIT	17
344372	77 TURKEY	4	2.50	0.58	100					YAYLA	17
345554	80 USSR	4	2.75	0.50	92					ALTAYSKIY KONSERVNYY	17
345555	80 USSR	4	2.50	0.58	83					DOKACHAEVSKIY 4	17
345556	80 USSR	4	2.75	0.50	92					GRUNTOVYY GRIBOVSKIY	17
345557	80 USSR	4	3.00	0.00	100					KARLIK 1185	17
345558	80 USSR	4	2.75	0.50	92					KIEVSKIY 139	17
345559	80 USSR	7	3.00	1.00	87					LUNGUSHOR	17
345560	80 USSR	3	3.00	0.00	100					MAYAK 12/20-4	17
345561	80 USSR	4	2.50	0.58	83					PUSHINSKIY 1853	17
345562	80 USSR	4	2.50	0.58	100					RANNIY 83	17
345563	80 USSR	4	3.00	0.00	120					SHATILOVSKIY 35	17
345564	80 USSR	4	2.50	0.58	100					SIBIRSKIY SKOROSPELYY	17
345565	80 USSR	4	2.75	0.50	110					SKOROSPELKA 1165	17
345566	80 USSR	3	2.67	0.58	107					TALALIHIN 186	17
345567	80 USSR	4	2.50	0.58	100					TAMBORSKIY UROZHAYNYY	17
345568	80 USSR	4	2.25	0.50	90					VOSHOD 119	17
346340	79 USA MISSOURI	4	2.25	0.50	90	6	0.17	0.41	17	MO. A. E. S. 160	12
346761	59 NIGERIA	3	2.67	0.58	107					BATTIPAGLIA 0156	17
346762	59 NIGERIA	6	2.33	0.82	80					BATTIPAGLIA 0457	17
346763	59 NIGERIA	12	2.08	0.51	76					BATTIPAGLIA 0557	17
346764	59 NIGERIA	4	2.25	0.96	90					BATTIPAGLIA - 0562	17
346765	59 NIGERIA	8	2.38	0.52	90					BATTIPAGLIA 0757	17
346766	59 NIGERIA	4	2.50	0.58	100					CHICO	17
346767	59 NIGERIA	4	2.25	0.96	90					MARMADE SPECIAL	17
346768	59 NIGERIA	4	2.25	0.50	82					PIACENZA 0164	17
346769	59 NIGERIA	4	3.00	0.00	109					PYGMY	17
346770	59 NIGERIA	4	2.50	0.58	91					RONITA	17
346886	80 USSR	4	2.75	0.50	100					ALTAISKIY RANNIY	17
346887	80 USSR	4	2.75	0.50	100					NEVSKIY	17
346888	80 USSR	4	2.25	0.50	90					BARNAULSKIY KONSERVINIY	17
346889	80 USSR	4	3.00	0.00	109					VITENU DIDEY	17
346890	80 USSR	4	2.50	0.58	91					MINSKIY RANNIY	17
347239	72 SWEDEN	4	3.00	0.00	109					IMMUNA	17
347240	72 SWEDEN	4	2.50	0.58	91					MINERVA	17
349237	38 HUNGARY	4	3.00	0.00	109					KECSKEMETI MEREVSZARU	17
349238	38 HUNGARY	4	2.75	0.50	100					KECSKEMETI 507	17
349239	38 HUNGARY	4	2.00	0.82	73					KECSKEMETI 3 F1	17
349593	56 NEW GUINEA	12	2.42	0.79	85					CROWN BEE	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
355057	76 THAILAND	4	3.00	0.00	109						17
355093	79 USA MARYLAND	3	3.00	0.00	109					ARMSTRONG W 218	17
355094	79 USA MARYLAND	4	2.25	0.50	82					BIELYJ NALIW	17
355095	79 USA MARYLAND	4	2.50	0.58	100					BREHMS SOLID RED	17
355097	79 USA MARYLAND	4	2.50	0.58	100					EARLY DETROIT	17
355098	79 USA MARYLAND	4	2.50	0.58	100					EARLY PAK NO. 7	17
355099	79 USA MARYLAND	4	2.25	0.50	90					FERGUSON	17
355100	79 USA MARYLAND	8	2.75	1.39	103					FRUHSTAMM	17
355101	79 USA MARYLAND	8	2.88	1.25	108					FUNDY	17
355102	79 USA MARYLAND	4	2.25	0.50	90					K51	17
355103	79 USA MARYLAND	4	2.25	0.50	90					KEN	17
355104	79 USA MARYLAND	4	3.00	0.00	100					KENEARLY	17
355105	79 USA MARYLAND	4	3.25	0.50	108					LABRADOR IMPROVED	17
355106	79 USA MARYLAND	4	3.25	0.50	108					LUSCIJIZ VESH 318	17
355107	79 USA MARYLAND	4	2.75	0.50	92					LENINGRADSKIJ SKOROSPELYJ	17
355108	79 USA MARYLAND	4	3.00	0.00	100					MINSKIJ RANNIJ	17
355110	79 USA MARYLAND	4	3.25	0.50	108					NAPOLI	17
355111	79 USA MARYLAND	4	3.00	0.00	100					NEUZUCHT 311	17
355112	79 USA MARYLAND	4	2.75	0.50	92					ORANGE SLICER	17
355113	79 USA MARYLAND	4	2.75	0.50	85					QUEBEC NO. 5	17
355114	79 USA MARYLAND	4	3.00	0.00	92					QUEBEC NO. 13	17
355115	79 USA MARYLAND	4	3.00	0.00	92					QUEBEC NO. 59	17
355116	79 USA MARYLAND	4	3.00	0.00	92					QUEBEC NO. 245	17
355117	79 USA MARYLAND	4	3.00	0.00	92					QUEBEC NO. 309	17
355118	79 USA MARYLAND	4	2.75	0.50	85					QUEBEC NO. 314	17
355119	79 USA MARYLAND	4	3.00	0.00	92					ROTKAPPCHEN	17
355120	79 USA MARYLAND	4	2.75	0.50	85					SCARLET SLICER	17
355121	79 USA MARYLAND	4	3.00	0.00	86					SCOTIA	17
355122	79 USA MARYLAND	4	3.00	0.00	86					SEKAI ICHI	17
355124	79 USA MARYLAND	4	3.25	0.50	93					TEPLICNYJ VTR 1805	17
355125	79 USA MARYLAND	4	3.25	0.50	93					VOLLENDUNY H2	17
355126	79 USA MARYLAND	4	2.75	0.50	79					WORLD BEST	17
355127	79 USA MARYLAND	4	3.00	0.00	86					YOZO	17
355889	18 COLOMBIA	4	3.25	0.50	93					CHUCHO	17
357228	83 YUGOSLAVIA	2	3.50	0.71	100					EDAR	17
357229	83 YUGOSLAVIA	4	3.50	0.58	108					JABUCAR	17
357230	83 YUGOSLAVIA	4	3.25	0.50	100					VOLOVSKO SRCE	17
357231	83 YUGOSLAVIA	4	3.25	0.50	100					VALANDOVSKI JABUCAR	17
357232	83 YUGOSLAVIA	4	3.50	0.58	108					DOMASEN JABUCAR	17
357233	83 YUGOSLAVIA	4	3.00	0.82	92					KABA JABUCAR	17
357234	83 YUGOSLAVIA	4	2.25	0.96	69					ROZE	17
357235	83 YUGOSLAVIA	4	3.25	0.50	100					SITEN JABUCAR	17
357236	83 YUGOSLAVIA	4	3.50	0.58	108					SITEN	17
357237	83 YUGOSLAVIA	4	3.25	0.50	93					STRUMICKI JABUCAR	17
357238	83 YUGOSLAVIA	4	3.50	0.58	100					ZOLT JABUCAR	17
357240	83 YUGOSLAVIA	4	3.50	0.58	100					ROZE JABUCAR	17
357241	83 YUGOSLAVIA	4	3.50	0.58	100						17
357242	83 YUGOSLAVIA	3	3.67	0.58	105					SVETI-NIKOLSKI JABUCAR	17
357243	83 YUGOSLAVIA	4	3.50	0.58	100					STRUSKI JABUCAR	17
357244	83 YUGOSLAVIA	4	3.00	0.00	86					LESKOVASKI JABUCAR	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
357245	83 YUGOSLAVIA	4	3.50	0.58	100					OHRIDSKI JABUCAR	17
357246	83 YUGOSLAVIA	4	3.25	0.50	100					OHRIDSKI SITEN	17
357247	83 YUGOSLAVIA	4	3.00	0.00	92					ROMA	17
357248	83 YUGOSLAVIA	7	2.86	0.90	87					BITOLSKI JABUCAR	17
357249	83 YUGOSLAVIA	4	3.75	0.50	115	4	3.00	0.00	100	SITEN DOMAT	16
357250	83 YUGOSLAVIA	4	3.75	0.50	115					GOSTIVARSKI	17
357251	83 YUGOSLAVIA	4	3.25	0.50	100					VRAPCISKI	17
357252	83 YUGOSLAVIA	3	3.33	0.58	103					SLIVOVIDEN	17
357253	83 YUGOSLAVIA	4	3.75	0.50	115					CIFLICKI	17
357254	83 YUGOSLAVIA	4	3.50	0.58	108					GRDOVSKI	17
357255	83 YUGOSLAVIA	4	3.00	0.00	92					ROZOV	17
357256	83 YUGOSLAVIA	4	3.00	0.00	92						17
357257	83 YUGOSLAVIA	4	3.25	0.50	100					EDAR CRVEN	17
357258	83 YUGOSLAVIA	4	3.00	0.00	92					EDAR ROZOV	17
357259	83 YUGOSLAVIA	4	3.00	0.00	92					JAJCEVIDEN	17
357260	83 YUGOSLAVIA	4	3.00	0.00	92					ROZE JABUCAR	17
357261	83 YUGOSLAVIA	4	3.50	0.58	108					KUMANOVSKI	17
357262	83 YUGOSLAVIA	4	3.50	0.58	108					VOJNICKI	17
357263	83 YUGOSLAVIA	4	3.25	0.50	100	4	2.75	0.50	92	CERESOVICEN	16
357264	83 YUGOSLAVIA	4	3.25	0.50	100					ROZOV	17
357265	83 YUGOSLAVIA	4	4.00	0.00	123					OTINSKI	17
357266	83 YUGOSLAVIA	8	2.88	0.83	85					JAJCEVIDEN	17
357267	83 YUGOSLAVIA	4	3.00	0.00	92					GINOVSKI	17
357268	83 YUGOSLAVIA	4	2.75	0.50	85					PRILEPSKI	17
357269	83 YUGOSLAVIA	3	4.00	0.00	123					LIMONOVIDEN	17
357270	83 YUGOSLAVIA	4	4.00	0.00	107					PRILEPSKI JABUCAR	17
357271	83 YUGOSLAVIA	3	4.00	0.00	107					VELESKI JABUCAR	17
357272	83 YUGOSLAVIA	4	3.75	0.50	100					CERESOVICEN	17
357273	83 YUGOSLAVIA	4	4.00	0.00	107					VODJANSKI	17
357274	83 YUGOSLAVIA	4	3.00	0.00	80					TETOVSKI	17
357275	83 YUGOSLAVIA	4	3.25	0.50	87					SLIVOVIDEN	17
357276	83 YUGOSLAVIA	4	3.00	0.00	80					EDAR	17
357277	83 YUGOSLAVIA	4	3.00	0.00	80					DOMASEN	17
357278	83 YUGOSLAVIA	4	4.00	0.00	100					EDAR JABACAR	17
357279	83 YUGOSLAVIA	4	3.50	0.58	88					BRZAK	17
357280	83 YUGOSLAVIA	4	3.25	0.50	81					RANA	17
357281	83 YUGOSLAVIA	4	4.00	0.00	100					DEBARSKI	17
357282	83 YUGOSLAVIA	4	3.25	0.50	81					STRUSKI JABUCAR	17
357283	83 YUGOSLAVIA	4	3.50	0.58	88					RAN ROZAR	17
357284	83 YUGOSLAVIA	4	3.25	0.50	81					LISICKI	17
357285	83 YUGOSLAVIA	4	3.25	0.50	81					ZELENIKOVSKI	17
357286	83 YUGOSLAVIA	4	3.75	0.50	107					NOVO-SELSKI JABUCAR	17
357287	83 YUGOSLAVIA	4	3.25	0.50	93					JABUCAR	17
357288	83 YUGOSLAVIA	3	3.67	0.58	105					CRVEN KRUPEN	17
358500	11 CANADA	3	3.33	0.58	95						17
358501	11 CANADA	2	3.50	0.71	100						17
358502	11 CANADA	3	3.67	0.58	105					SUB-ARCTIC PLENTY	17
358503	11 CANADA	4	3.00	0.00	86						17
358504	11 CANADA	3	3.33	0.58	95					SUB-ARCTIC MIDI	17
358505	11 CANADA	4	3.25	0.50	108					56-8 X FIREBALL (56-1XFIREBALL	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
358506 11	CANADA	4	3.25	0.50	108					(56-1 X FIREBALL) X FIREBALL	17
358509 11	CANADA	2	3.00	0.00	100						17
358510 11	CANADA	4	3.00	0.00	100						17
358511 11	CANADA	4	3.75	0.50	125						17
358512 11	CANADA	3	3.33	0.58	111						17
358513 11	CANADA	4	3.75	0.50	125						17
358514 11	CANADA	2	3.00	0.00	86						17
358515 11	CANADA	4	3.00	0.00	109						17
358516 11	CANADA	4	3.25	0.50	118						17
358517 11	CANADA	4	2.75	0.50	100						17
358518 11	CANADA	4	3.50	0.58	127						17
358519 11	CANADA	4	3.75	0.50	136						17
358520 11	CANADA	4	3.75	0.50	136						17
358815 49	MALAYSIA	18	1.50	1.04	54	4	0.00	0.00	0		17
358816 49	MALAYSIA	7	2.86	1.21	173	4	0.75	1.50	33		17
358817 49	MALAYSIA	8	2.13	1.36	96	4	0.75	1.50	33		17
358818 49	MALAYSIA	15	1.93	1.16	68	4	0.50	1.00	22		17
358819 49	MALAYSIA	3	3.33	0.58	95						17
358956 26	EL SALVADOR	4	3.50	0.58	100	8	2.38	0.74	108		12
362102 27	ENGLAND	4	3.50	0.58	100					MANX MARVEL	17
365896 24	ECUADOR	4	3.50	0.58	100	4	2.50	0.58	100		11
365899 24	ECUADOR	4	3.25	0.50	93					TOMATE RINON	17
365900 24	ECUADOR	4	3.25	0.50	93					TOMATE RINON	17
365901 24	ECUADOR	4	3.75	0.50	107						17
365902 24	ECUADOR	3	3.00	0.00	86						17
365904 24	ECUADOR	4	4.00	0.00	114	4	0.00	0.00	0	MONTE GALLINAZO	7
365905 24	ECUADOR	4	3.50	0.58	100	4	0.00	0.00	0		7
365906 24	ECUADOR	3	3.00	0.00	86	4	0.00	0.00	0		7
365907 24	ECUADOR					4	0.00	0.00	0		8
365908 24	ECUADOR	4	3.75	0.50	107	4	0.00	0.00	0		7
365909 24	ECUADOR	4	3.50	0.58	100	8	1.50	0.93	68		12
365910 24	ECUADOR	4	3.00	0.00	86	8	0.88	0.64	35		12
365911 24	ECUADOR	4	3.50	0.58	100	8	1.38	0.74	70		12
365912 24	ECUADOR	4	3.25	0.50	93	8	1.00	0.00	45		12
365913 24	ECUADOR	4	3.75	0.50	107	8	0.00	0.00	0		12
365914 24	ECUADOR	4	3.75	0.50	107	8	0.00	0.00	0		12
365915 24	ECUADOR	4	3.50	0.58	100	8	0.75	0.71	40		12
365916 24	ECUADOR	4	3.25	0.50	93	8	1.88	0.83	80		12
365917 24	ECUADOR	4	2.75	0.50	79	8	0.13	0.35	4		12
365918 24	ECUADOR	4	3.50	0.58	127	8	0.63	0.74	42	MORA	12
365920 63	PERU	4	3.25	0.50	118						17
365921 63	PERU	4	3.25	0.50	118						17
365922 63	PERU	4	3.50	0.58	127						17
365923 63	PERU	4	3.25	0.50	118						17
365924 63	PERU	4	3.00	0.00	109					CHAINA TOMATE	17
365925 63	PERU	4	3.00	0.00	109						17
365926 63	PERU	4	2.75	0.50	100						17
365927 63	PERU	4	3.25	0.50	108	4	0.50	1.00	17		16
365928 63	PERU	4	3.50	0.58	117	8	1.13	0.83	46		12
365929 63	PERU	4	3.25	0.50	108	8	1.63	0.74	75		12

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
365930	63 PERU	8	2.50	0.53	76						17
365947	63 PERU	3	2.67	0.58	89						9
365948	63 PERU	4	3.00	0.00	100						9
365951	63 PERU	8	2.50	0.53	77	4	1.00	0.82	40		10
365953	63 PERU	4	3.00	0.00	100						9
365955	63 PERU	4	3.50	0.58	117						9
365957	63 PERU	4	3.25	0.50	108	8	0.00	0.00	0		12
365958	63 PERU					4	2.50	0.58	77		12
365959	63 PERU	4	3.00	0.00	100	8	0.13	0.35	4		12
365960	63 PERU	4	3.50	0.58	117	8	0.38	0.74	12		12
365961	63 PERU	4	3.25	0.50	108	8	0.63	0.74	19		12
365962	63 PERU	4	3.25	0.50	108	8	1.75	0.89	81		12
365963	63 PERU	4	3.00	0.00	100	4	0.25	0.50	13		12
365964	63 PERU	4	3.50	0.58	117	8	0.25	0.46	8		12
365965	63 PERU	4	2.25	0.50	75	8	0.25	0.46	8		12
365966	63 PERU	4	2.75	0.50	92	8	0.00	0.00	0		12
365967	63 PERU	4	3.25	0.50	108	8	0.00	0.00	0		12
365968	63 PERU	4	3.00	0.00	100					KITEA TOMATI	9
365969	63 PERU	4	3.00	0.00	100						9
367937	8 BRAZIL	4	3.00	0.00	100						17
367938	8 BRAZIL	4	3.00	0.00	100						17
367939	8 BRAZIL	4	3.50	0.58	117						17
367940	8 BRAZIL	4	3.25	0.50	100						17
367941	8 BRAZIL	4	3.00	0.00	92						17
367942	8 BRAZIL	4	3.25	0.50	100						17
367943	8 BRAZIL	4	3.00	0.00	92						17
367946	8 BRAZIL	3	3.00	0.00	92						17
367947	8 BRAZIL	4	2.75	0.50	85						17
367948	8 BRAZIL	4	3.25	0.50	100						17
367950	8 BRAZIL	4	3.00	0.00	92						17
367951	8 BRAZIL	4	3.75	0.50	115						17
367952	8 BRAZIL	3	3.67	0.58	113						17
367953	8 BRAZIL	4	3.00	0.00	92						17
367954	8 BRAZIL	4	3.25	0.50	100						17
367955	8 BRAZIL	4	2.75	0.50	85						17
367956	8 BRAZIL	4	3.00	0.00	92					WEST VIRGINIA 63	17
367957	8 BRAZIL	3	2.00	1.00	62					MANALUCIE	17
367958	8 BRAZIL	4	2.25	0.96	69					PEXY BEAUTY	17
367959	8 BRAZIL	4	2.50	0.58	83						17
367960	8 BRAZIL	4	3.00	0.00	100						17
367961	8 BRAZIL	8	2.50	0.53	76						17
367962	8 BRAZIL	8	2.25	0.71	75						17
367963	8 BRAZIL	8	2.25	0.46	75						17
367964	8 BRAZIL	4	3.75	0.50	125						17
367965	8 BRAZIL	4	3.00	0.00	100						17
367966	8 BRAZIL	4	3.00	0.00	100						17
367967	8 BRAZIL	4	3.00	0.00	92						17
367968	8 BRAZIL	2	3.00	0.00	92						17
367969	8 BRAZIL	4	3.25	0.50	100						17
367970	8 BRAZIL	4	3.00	0.00	92						17

PI CODE	SOURCE	BACTERIAL SPOT N	BACTERIAL SPOT M	BACTERIAL SPOT STD	BACTERIAL SPOT DI	BACTERIAL SPECK N	BACTERIAL SPECK M	BACTERIAL SPECK STD	BACTERIAL SPECK DI	CULTIVAR	SPECIES
367971	8 BRAZIL	3	3.00	0.00	92						17
367972	8 BRAZIL	4	3.00	0.00	92						17
367973	8 BRAZIL	3	3.00	0.00	92						17
367974	8 BRAZIL	4	3.00	0.00	92						17
367975	8 BRAZIL	4	3.00	0.00	75						17
367976	8 BRAZIL	4	3.00	0.00	75						17
367977	8 BRAZIL	3	3.33	0.58	83						17
367978	8 BRAZIL	4	3.00	0.00	75						17
367979	8 BRAZIL	3	3.00	0.00	75						17
367980	8 BRAZIL	4	3.00	0.00	75						17
367981	8 BRAZIL	11	2.55	0.52	78						17
367982	8 BRAZIL	3	2.67	0.58	67						17
367983	8 BRAZIL	4	3.75	0.50	100						17
367984	8 BRAZIL	4	2.75	0.50	73						17
367985	8 BRAZIL	4	3.00	0.00	80						17
367986	8 BRAZIL	4	2.75	0.50	73						17
367987	8 BRAZIL	3	4.00	0.00	107						17
367988	8 BRAZIL	4	3.00	0.00	80						17
367989	8 BRAZIL	3	3.00	0.00	80						17
367990	8 BRAZIL	4	3.00	0.00	80						17
367991	8 BRAZIL	4	2.75	0.50	92						17
367992	8 BRAZIL	4	2.50	0.58	83						17
367993	8 BRAZIL	4	3.00	0.00	100						17
367994	8 BRAZIL	4	3.00	0.00	100						17
367995	8 BRAZIL	4	2.50	0.58	83						17
367996	8 BRAZIL	4	2.50	0.58	83						17
367997	8 BRAZIL	4	2.25	0.50	75						17
367998	8 BRAZIL	4	3.00	0.00	100						17
367999	8 BRAZIL	3	3.00	0.00	75						17
368000	8 BRAZIL	4	3.75	0.50	94						17
368001	8 BRAZIL	4	3.25	0.96	81						17
368002	8 BRAZIL	4	3.25	0.50	81						17
368003	8 BRAZIL	4	3.00	0.00	75						17
368004	8 BRAZIL	3	3.00	0.00	75						17
368005	8 BRAZIL	4	3.25	0.50	81						17
368006	8 BRAZIL	4	3.25	0.50	81						17
368167	79 USA MICHIGAN	4	3.50	0.58	108					MINI RED CHERRY	17
368168	79 USA MICHIGAN	4	3.75	0.50	115					MINI RED CURRENT	17
368169	79 USA MICHIGAN	4	3.50	0.58	108					MINI RED PEAR	17
368170	79 USA MICHIGAN	4	3.25	0.50	100					MINI RED PLUM	17
368653	83 YUGOSLAVIA	4	3.00	0.00	92					JABUCAR-CRVEN	17
368654	83 YUGOSLAVIA	4	3.00	0.00	92					JABUCAR ROSE I	17
368655	83 YUGOSLAVIA	4	2.75	0.50	85						17
368656	83 YUGOSLAVIA	4	3.50	0.58	108					JABUCAR	17
368657	83 YUGOSLAVIA	4	2.75	0.50	79					CRVEN	17
368658	83 YUGOSLAVIA	3	3.00	0.00	86					SLIVOLIKI	17
368659	83 YUGOSLAVIA	4	3.25	0.50	93					JABUCAR-CRVEN	17
368660	83 YUGOSLAVIA	3	3.33	0.58	95					ROZE	17
368661	83 YUGOSLAVIA	4	3.00	0.00	86					CRVENI	17
368662	83 YUGOSLAVIA	4	3.00	0.00	100					CRVENI JABUCAR	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
368663	83 YUGOSLAVIA	4	3.00	0.00	100					JABUCAR	17
368664	83 YUGOSLAVIA	4	3.00	0.00	100					ROZE	17
368665	83 YUGOSLAVIA	4	2.50	0.58	83					ZBNCKANI	17
368666	83 YUGOSLAVIA	4	2.75	0.50	92					DOMASEN JABUCAR	17
368667	83 YUGOSLAVIA	4	3.00	0.00	100					SITNI SAMONIKLI	17
368668	83 YUGOSLAVIA	4	3.00	0.00	100					SAMONIKLI	17
368669	83 YUGOSLAVIA	4	2.75	0.50	92					JABUCAR	17
368670	83 YUGOSLAVIA	4	2.75	0.50	85					FRENKI	17
368671	83 YUGOSLAVIA	4	3.00	0.00	92					ROZE REBRAST	17
368672	83 YUGOSLAVIA	4	3.00	0.00	92					SPLESNATI LOKALNI	17
368673	83 YUGOSLAVIA	4	3.00	0.00	92					CERESOVIDNI	17
368674	83 YUGOSLAVIA	4	2.75	0.50	85					KRUPEN GLADOK	17
368675	83 YUGOSLAVIA	4	3.00	0.00	92					KRUPEN	17
368676	83 YUGOSLAVIA	4	2.75	0.50	85					JABUCAR	17
368677	83 YUGOSLAVIA	4	2.50	0.58	77					STARO SEME I	17
368678	83 YUGOSLAVIA	4	3.00	0.00	109					CERESOVIDEN	17
368679	83 YUGOSLAVIA	4	3.00	0.00	109						17
368680	83 YUGOSLAVIA	4	3.00	0.00	109					STARO SEME II	17
368681	83 YUGOSLAVIA	7	2.29	0.49	78					DOMASEN	17
368682	83 YUGOSLAVIA	4	3.25	0.50	118					JABUCAR I	17
368683	83 YUGOSLAVIA	3	3.33	0.58	121					JABUCAR II	17
368684	83 YUGOSLAVIA	4	3.00	0.82	109					JABUCAR VISINSKI	17
368685	83 YUGOSLAVIA	4	3.00	0.00	109					JABUCAR KRUPEN	17
368686	83 YUGOSLAVIA	4	3.25	0.50	93					JABUCAR POLSKI	17
368687	83 YUGOSLAVIA	4	3.25	0.50	93					JABUCAR SO MALI REBRA	17
368688	83 YUGOSLAVIA	4	3.25	0.50	93					DOMASEN	17
368689	83 YUGOSLAVIA	4	3.50	0.58	100					SAMONIKLI	17
368690	83 YUGOSLAVIA	4	3.50	0.58	100					BUGARSKI	17
368691	83 YUGOSLAVIA	3	3.33	0.58	95					LOKALEN	17
368692	83 YUGOSLAVIA	4	3.00	0.00	86					JABUCAR LOKALEN	17
368693	83 YUGOSLAVIA	4	2.75	0.50	79					JABUCAR	17
368694	83 YUGOSLAVIA	4	3.25	0.50	93					VRATNICKI	17
368846	32 GHANA	4	3.00	0.00	86						17
368847	32 GHANA	3	3.33	0.58	95						17
370035	39 INDIA	4	3.75	0.50	107					CO.1	17
370036	39 INDIA	4	3.50	0.58	100					PUSA RUBY	17
370061	11 CANADA	4	3.25	0.50	93					BEAVERLODGE 6801	17
370062	11 CANADA	4	4.00	0.00	114					BEAVERLODGE 6806	17
370063	11 CANADA	4	4.00	0.00	114					BEAVERLODGE 6808	17
370064	11 CANADA	2	3.50	0.71	108					V-671	17
370065	11 CANADA	3	3.67	0.58	113					V-672	17
370066	11 CANADA	4	3.50	0.58	108					V-673	17
370067	11 CANADA	4	3.00	0.00	92					V-674	17
370068	11 CANADA	4	3.50	0.58	108					V-675	17
370069	11 CANADA	4	3.25	0.50	100					V-676	17
370070	11 CANADA	4	3.00	0.00	92					V-679	17
370071	11 CANADA	4	3.25	0.50	100					V-6710	17
370072	11 CANADA	4	3.00	0.00	109	4	2.25	0.50	75	V-6714	16
370073	11 CANADA	4	3.50	0.58	127					V-6716	17
370074	11 CANADA	4	3.00	0.00	86					V-6719	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
370075	11 CANADA	4	3.25	0.50	93	4	3.00	0.00	109	V-6720	16
370076	11 CANADA	4	3.75	0.50	107					V-6722	17
370077	11 CANADA	4	3.50	0.58	100					V-6725	17
370078	11 CANADA	4	2.75	0.50	79					V-6726	17
370079	11 CANADA	4	3.50	0.58	100					V-6727	17
370080	11 CANADA	4	4.00	0.00	114	4	0.00	0.00	0	SUB-ARCTIC DELIGHT	17
370081	11 CANADA	4	3.25	0.50	93					CRIMSON SPRINTER	17
370082	11 CANADA	4	3.00	0.00	75					BAY STATE	17
370083	11 CANADA	2	3.50	0.71	88					IMPROVED BAY STATE	17
370084	11 CANADA	4	3.75	0.50	94					WALTHAM MOLDPROOF FORCING	17
370085	11 CANADA	4	4.00	0.00	100					PURDUE 135	17
370086	11 CANADA	4	3.50	0.58	88					VINEQUEEN	17
370087	11 CANADA	4	3.50	0.58	88						17
370088	11 CANADA	4	3.50	0.58	88	8	0.00	0.00	0	FARTHEST NORTH	17
370089	11 CANADA	4	4.00	0.00	100					RIDEAU	17
370090	11 CANADA	4	3.75	0.50	100					NEW HAMPSHIRE #50	17
370091	11 CANADA	4	3.75	0.50	100					VISION	17
370092	11 CANADA	4	3.75	0.50	100					VEESET	17
370093	11 CANADA	4	3.25	0.50	87	4	2.00	0.00	62		12
370129	11 CANADA	4	4.00	0.00	107					V-6724	17
370482	83 YUGOSLAVIA	4	4.00	0.00	107					SITEN	17
370483	83 YUGOSLAVIA	4	4.00	0.00	107					DZEPISTE	17
370484	83 YUGOSLAVIA	4	3.50	0.58	93					LOKALEN	17
370485	83 YUGOSLAVIA	4	4.00	0.00	107					JABUCAR	17
370486	83 YUGOSLAVIA	4	2.75	0.50	73					RANKA	17
370487	83 YUGOSLAVIA	4	3.75	0.50	100					BRAJCINSKI	17
370488	83 YUGOSLAVIA	4	4.00	0.00	107					MANASTIRSKI	17
370489	83 YUGOSLAVIA	4	3.75	0.50	100					DOMASEN	17
370490	83 YUGOSLAVIA	4	3.50	0.58	93						17
370491	83 YUGOSLAVIA	4	4.00	0.00	107					JABUCAR	17
370492	83 YUGOSLAVIA	4	4.00	0.00	107					SAMONIKNALO	17
370493	83 YUGOSLAVIA	4	4.00	0.00	133					DOMASEN JABUCAR	17
370494	83 YUGOSLAVIA	4	4.00	0.00	133					JABUCAR-CRVEN	17
370495	83 YUGOSLAVIA	4	3.75	0.50	125					RESENSKI	17
370496	83 YUGOSLAVIA	4	3.75	0.50	125					STAROSEME	17
370497	83 YUGOSLAVIA	4	3.50	0.58	117					LOKALEN	17
370498	83 YUGOSLAVIA	4	3.50	0.58	117					BUKOVICK	17
372361	30 FRENCH GUIANA	4	2.75	0.50	92						16
372362	30 FRENCH GUIANA	4	3.00	0.00	100	4	2.00	0.00	73		16
372363	30 FRENCH GUIANA	4	3.00	0.00	75	4	2.25	0.50	82		16
372364	30 FRENCH GUIANA	4	2.75	0.50	69						17
372365	30 FRENCH GUIANA	4	3.50	0.58	88						17
372366	30 FRENCH GUIANA	4	3.00	0.00	75						17
372367	30 FRENCH GUIANA	4	3.75	0.50	94						17
372368	30 FRENCH GUIANA	3	3.33	0.58	83						17
372369	30 FRENCH GUIANA	4	3.00	0.82	75						17
372370	30 FRENCH GUIANA	4	3.50	0.58	88						17
372371	30 FRENCH GUIANA	4	3.00	0.00	86						17
372372	30 FRENCH GUIANA	4	3.50	0.58	100						17
372373	30 FRENCH GUIANA	4	3.25	0.50	93						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
372377	35 GUADELOUPE	7	3.29	0.49	100						17
372378	35 GUADELOUPE	4	3.25	0.50	93						17
372379	35 GUADELOUPE	4	3.50	0.58	100						17
372380	35 GUADELOUPE	8	3.25	0.46	100						17
372381	35 GUADELOUPE	4	3.00	0.00	86						17
372382	35 GUADELOUPE	8	3.00	0.00	90						17
372383	35 GUADELOUPE	4	3.25	0.50	87						17
372384	35 GUADELOUPE	4	3.75	0.50	100						17
372385	35 GUADELOUPE	6	3.67	0.52	103						17
372386	35 GUADELOUPE	4	4.00	0.00	107						17
372387	35 GUADELOUPE	4	3.50	0.58	93						17
372388	35 GUADELOUPE	4	3.25	0.50	87						17
372389	35 GUADELOUPE	4	3.00	0.00	80						17
372390	35 GUADELOUPE	12	1.83	0.72	59						17
375937	79 USA MISSOURI	11	1.27	0.47	41	4	0.00	0.00	0		12
376072	49 MALAYSIA	8	3.50	0.76	93	4	3.00	0.00	133		17
378632	84 ZAIRE	3	3.33	0.58	83					MAUMA	17
378992	63 PERU	4	3.75	0.50	94						17
378993	63 PERU	4	3.00	0.00	75						17
378994	63 PERU	2	3.50	0.71	88						17
378995	63 PERU	4	3.00	0.82	75						17
378996	63 PERU	4	3.50	0.58	88						17
378997	63 PERU	4	4.00	0.00	100						17
378998	63 PERU	4	3.25	0.50	81						17
378999	63 PERU	4	3.75	0.50	94						17
379000	63 PERU	2	3.50	0.71	88						17
379001	63 PERU	4	3.50	0.58	88						17
379002	63 PERU	3	3.00	0.00	75						17
379003	63 PERU	4	3.00	0.00	75						17
379004	63 PERU	4	3.25	0.50	81						17
379005	63 PERU	4	3.25	0.50	81						17
379006	63 PERU	4	3.00	0.00	75						17
379007	63 PERU	4	3.50	0.58	88						17
379008	63 PERU	4	3.25	0.50	81						17
379009	63 PERU	8	2.50	0.76	78						17
379018	63 PERU	4	3.50	0.58	88	4	0.75	1.50	33		9
379019	63 PERU	4	2.75	0.50	69	4	0.00	0.00	0		12
379020	63 PERU	8	2.13	0.83	69	4	0.00	0.00	0		12
379021	63 PERU	4	3.25	0.50	108	4	2.75	0.50	85		12
379022	63 PERU	8	2.50	0.53	88	4	0.50	0.58	17		12
379023	63 PERU	8	2.25	0.46	79	4	0.50	0.58	17		12
379024	63 PERU	8	2.25	0.46	79	4	0.00	0.00	0		12
379025	63 PERU	4	3.25	0.50	108	4	2.25	0.50	75		12
379026	63 PERU	4	3.00	0.00	100	4	0.75	0.50	25		12
379027	63 PERU	4	3.00	0.00	100	4	0.50	0.58	17		12
379028	63 PERU	4	3.00	0.00	100	4	0.25	0.50	8		12
379029	63 PERU	3	2.67	0.58	89	4	1.00	0.82	40		9
379030	63 PERU	3	2.67	0.58	89	4	1.25	0.50	50		9
379031	63 PERU	3	2.00	0.00	67	4	1.75	0.50	70		9
379032	63 PERU	4	2.00	0.00	67	4	2.00	0.00	89		9

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
379033	63 PERU	4	3.00	0.00	100	4	2.00	0.00	80		9
379034	63 PERU					4	1.75	0.50	100		9
379035	24 ECUADOR	3	3.00	0.00	100	4	2.25	0.50	129		11
379039	24 ECUADOR	4	3.25	0.50	108	4	2.00	0.00	114		11
379041	24 ECUADOR	4	3.50	0.58	117						11
379043	24 ECUADOR	4	3.75	0.50	94						17
379044	24 ECUADOR	3	3.67	0.58	92						17
379045	24 ECUADOR	4	3.75	0.50	94						17
379046	24 ECUADOR	3	3.00	0.00	75						17
379047	1	3	3.00	1.00	75						18
379048	24 ECUADOR	3	3.00	0.00	75					SLIVOLIKI	17
379049	24 ECUADOR	7	2.29	0.95	71						17
379050	24 ECUADOR	7	1.71	0.76	46						17
379051	24 ECUADOR	7	2.43	0.79	76						17
379052	24 ECUADOR	4	2.75	0.50	92						17
379053	24 ECUADOR	8	2.00	0.76	61						17
379054	24 ECUADOR	8	1.25	1.39	36						17
379055	24 ECUADOR	4	2.25	0.50	75						17
379057	24 ECUADOR	4	2.25	0.96	75	4	1.25	0.50	42		12
379058	24 ECUADOR	8	2.38	0.74	72	4	2.75	0.50	100		12
379059	24 ECUADOR	8	1.88	1.55	55	4	0.25	0.50	9		12
379060	24 ECUADOR	4	3.25	0.50	130						17
379061	24 ECUADOR	4	2.50	0.58	100						17
379373	83 YUGOSLAVIA	4	2.50	0.58	100					JABUCAR-CRVEN	17
379374	83 YUGOSLAVIA	4	2.75	0.50	110					JABUCAR	17
379375	83 YUGOSLAVIA	4	3.00	0.00	120					KRUSKOLIKI	17
379376	83 YUGOSLAVIA	4	3.00	0.00	120					KRUPEN, CRVENO-ZOLTENIKAV	17
379377	83 YUGOSLAVIA	3	3.00	0.00	120					JABUCAR	17
379378	83 YUGOSLAVIA	4	3.50	0.58	140					PEMBOV	17
379379	83 YUGOSLAVIA	4	3.00	0.00	100					ALOV	17
379380	83 YUGOSLAVIA	4	3.00	0.00	100					JABUCAR	17
379381	83 YUGOSLAVIA	4	2.50	0.58	83					PLAVO-CRVENO	17
379382	83 YUGOSLAVIA	4	3.00	0.00	100					CRVEN	17
379383	83 YUGOSLAVIA	4	3.00	0.00	100					JABUCAST	17
379384	83 YUGOSLAVIA	3	2.67	0.58	89					SITEN	17
379385	83 YUGOSLAVIA	4	3.00	0.00	100					JABUCAST	17
379386	83 YUGOSLAVIA	4	3.00	0.00	100					KOKTAREST	17
379387	83 YUGOSLAVIA	4	4.00	0.00	114					SITEN STAR	17
379388	83 YUGOSLAVIA	4	3.50	0.58	100					JABUCAR	17
379389	83 YUGOSLAVIA	4	3.75	0.50	107					SECEREN JABUCAR	17
379390	83 YUGOSLAVIA	4	3.25	0.50	93					PLAVO-CRVENO	17
379391	83 YUGOSLAVIA	4	3.50	0.58	100					JABUCAR	17
379392	83 YUGOSLAVIA	4	3.25	0.50	93					DOLG MAJET	17
379393	83 YUGOSLAVIA	4	3.25	0.50	93					KRUPEN-REBRAST	17
379394	83 YUGOSLAVIA	4	3.50	0.58	100					SITEN	17
379395	83 YUGOSLAVIA	4	3.00	0.00	100					MAZEN-KRUPEN	17
379396	83 YUGOSLAVIA	4	2.75	0.50	92						17
379397	83 YUGOSLAVIA	4	3.00	0.00	100					KRUPEN-CRVEN	17
379398	83 YUGOSLAVIA	4	3.50	0.58	117					CRVEN	17
379399	83 YUGOSLAVIA	4	3.50	0.58	117					CRVEN-PRODOLGOVAT	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
379400	83 YUGOSLAVIA	8	2.88	0.64	88					JABUCAR	17
379401	83 YUGOSLAVIA	4	3.25	0.50	108					SRCE	17
379402	83 YUGOSLAVIA	4	3.50	0.58	117					LOKALEN	17
379403	83 YUGOSLAVIA	4	4.00	0.00	123					CRVEN KRUPEN	17
379404	83 YUGOSLAVIA	4	3.50	0.58	108					JABUCAR, PLAVO- CRVEN	17
379405	83 YUGOSLAVIA	4	3.25	0.50	100					JABUCAR-CRVEN	17
379406	83 YUGOSLAVIA	3	3.33	0.58	103					SLOVENSKI JABUCAR	17
379407	83 YUGOSLAVIA	4	3.25	0.50	100					JABUCAR	17
379408	83 YUGOSLAVIA	3	3.00	0.00	92						17
379409	83 YUGOSLAVIA	3	3.00	0.00	92					LOKALEN	17
379410	83 YUGOSLAVIA	4	3.50	0.58	108					JABUCAR	17
379411	83 YUGOSLAVIA	4	3.75	0.50	115					KRUPEN	17
383434	48 MALAWI	4	4.00	0.00	123					MARVEL	17
383435	48 MALAWI	4	3.50	0.58	108					RED KAKI	17
385973	46 KENYA	4	3.75	0.50	115					PRIMABEL	17
386240	3 ARGENTINA	4	3.00	0.00	92					PLATENSE J. J. GOMEZ	17
386241	3 ARGENTINA	4	2.75	0.50	85					ROMA SEL. LA CONSULTA	17
386242	3 ARGENTINA	4	3.25	0.50	100					RONITA LA COSULTA	17
386243	3 ARGENTINA	4	3.25	0.50	100					ROSSOL SEL. LA CONSULTA	17
386247	39 INDIA	4	3.50	0.58	117					'HOTSET' U. S. - E. C. 21193	17
386248	39 INDIA	4	3.25	0.50	108						17
387853	7 BOLIVIA	8	2.75	0.46	85						17
387854	7 BOLIVIA	8	2.88	0.35	96						17
387855	7 BOLIVIA	4	3.00	0.00	100						17
390008	76 THAILAND	4	4.00	0.00	133						17
390009	76 THAILAND	4	3.00	0.00	100						17
390398	18 COLOMBIA	4	3.25	0.50	108						17
390399	18 COLOMBIA	4	3.75	0.50	107						17
390400	18 COLOMBIA	4	3.00	0.00	86						17
390401	18 COLOMBIA	4	3.50	0.58	100						17
390402	18 COLOMBIA	4	3.75	0.50	107						17
390403	18 COLOMBIA	4	3.25	0.50	93						17
390404	18 COLOMBIA	4	3.25	0.50	93						17
390405	18 COLOMBIA	4	3.50	0.58	100						17
390406	18 COLOMBIA	4	3.50	0.58	100						17
390407	18 COLOMBIA	4	3.75	0.50	115						17
390408	18 COLOMBIA	3	3.33	0.58	103						17
390409	18 COLOMBIA	4	3.75	0.50	115						17
390410	18 COLOMBIA	4	3.25	0.50	100						17
390488	24 ECUADOR	4	3.25	0.50	100						17
390489	24 ECUADOR	12	2.00	0.85	67						17
390490	24 ECUADOR	3	3.00	0.00	92						17
390491	24 ECUADOR	8	2.38	0.52	76						17
390492	24 ECUADOR	8	2.63	0.52	88						17
390493	24 ECUADOR	4	2.75	0.50	92						17
390494	24 ECUADOR	4	2.75	0.50	92						17
390495	24 ECUADOR	4	3.75	0.50	125						17
390496	24 ECUADOR	4	3.50	0.58	117						17
390497	24 ECUADOR	4	3.00	0.00	100						17
390498	24 ECUADOR	4	3.25	0.50	108						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
390499 24	ECUADOR	4	4.00	0.00	133						17
390500 24	ECUADOR	4	3.00	0.00	92						17
390501 24	ECUADOR	4	3.00	0.00	92						17
390502 24	ECUADOR	4	4.00	0.00	123						17
390503 24	ECUADOR	4	3.50	0.58	108						17
390504 24	ECUADOR	4	3.75	0.50	115						17
390505 24	ECUADOR	3	3.33	0.58	103						17
390506 24	ECUADOR	4	3.25	0.50	100						17
390507 24	ECUADOR	4	3.75	0.50	115						17
390508 24	ECUADOR	4	4.00	0.00	133						17
390509 24	ECUADOR	4	3.25	0.50	108						17
390510 24	ECUADOR	4	3.50	0.58	117						17
390511 24	ECUADOR	4	3.75	0.50	125						17
390512 24	ECUADOR	4	3.75	0.50	125						17
390513 24	ECUADOR	4	3.00	0.00	100	8	0.00	0.00	0		7
390514 24	ECUADOR	23	2.30	1.02	71	4	0.00	0.00	0		8
390516 24	ECUADOR	16	2.63	1.36	85	4	0.00	0.00	0		8
390517 24	ECUADOR	4	3.75	0.50	150	3	2.00	0.00	73		7
390519 24	ECUADOR	4	4.00	0.00	160	4	0.00	0.00	0		12
390640 63	PERU	4	3.25	0.50	130						17
390641 63	PERU	4	3.50	0.58	140						17
390642 63	PERU	4	3.25	0.50	130					HUANDO	17
390643 63	PERU	4	3.00	0.00	120						17
390644 63	PERU	4	3.25	0.50	130						17
390645 63	PERU	4	3.25	0.50	130						17
390646 63	PERU	4	3.50	0.58	117						17
390647 63	PERU	4	3.00	0.00	100						17
390648 63	PERU	8	2.75	0.46	92						17
390649 63	PERU	4	3.00	0.00	100						17
390650 63	PERU	4	3.00	0.00	100						17
390658 63	PERU	4	3.00	0.82	100	4	0.00	0.00	0		7
390660 63	PERU	4	3.00	0.00	100	4	0.00	0.00	0		7
390661 63	PERU	4	3.00	0.00	100	3	0.00	0.00	0		7
390662 63	PERU	4	3.75	0.50	115	4	0.00	0.00	0		7
390663 63	PERU	4	3.25	0.50	100	4	0.00	0.00	0		7
390664 63	PERU	4	3.00	0.00	92						9
390665 63	PERU	3	3.00	0.00	92						9
390677 63	PERU	4	3.00	0.00	92						9
390678 63	PERU	4	3.00	0.00	92						9
390679 63	PERU	4	3.00	0.00	92						9
390681 63	PERU	3	3.33	0.58	103	4	0.50	0.58	22		9
390682 63	PERU	4	3.25	0.50	100	4	0.00	0.00	0		9
390683 63	PERU	2	3.00	0.00	92	4	1.25	0.96	56		9
390684 63	PERU	4	3.00	0.00	92	4	1.75	0.50	70		9
390685 63	PERU	8	2.75	0.46	88	4	1.00	1.15	40		9
390687 63	PERU	7	1.00	0.00	35						9
390688 63	PERU	4	3.00	0.00	92	4	0.00	0.00	0		12
390689 63	PERU	4	2.75	0.50	85	4	0.00	0.00	0		12
390690 63	PERU	4	2.75	0.50	85	4	0.00	0.00	0		12
390691 63	PERU	4	3.25	0.50	100	3	0.00	0.00	0		12

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
390692	63 PERU	4	3.00	0.00	92	4	0.00	0.00	0		12
390693	63 PERU	4	3.50	0.58	108	4	1.25	0.96	42		12
390694	63 PERU	4	3.50	0.58	108	4	0.00	0.00	0		12
390695	63 PERU	4	3.75	0.50	115	4	1.25	1.50	42		12
390696	63 PERU	4	3.50	0.58	108	4	1.50	0.58	50		12
390697	63 PERU	4	3.25	0.50	100	4	0.50	0.58	17		12
390698	63 PERU	3	3.33	0.58	103	4	1.00	0.82	33		12
390699	63 PERU	4	3.75	0.50	136	4	1.00	0.82	33		12
390700	63 PERU	4	2.25	0.50	82	4	1.25	0.50	42		12
390701	63 PERU	4	2.75	0.50	100	4	2.50	0.58	77		12
390702	63 PERU	8	2.00	0.93	69	4	0.00	0.00	0		12
390703	63 PERU	4	2.25	0.50	82	4	0.25	0.50	8		12
390704	63 PERU	4	2.00	0.82	73	4	0.00	0.00	0		12
390705	63 PERU	8	2.38	0.74	86	4	0.00	0.00	0		12
390706	63 PERU	8	2.00	1.07	73	4	0.50	1.00	15		12
390707	63 PERU	4	3.25	0.50	108	4	0.00	0.00	0		12
390708	63 PERU	4	3.75	0.50	125	4	0.00	0.00	0		12
390709	63 PERU	4	3.25	0.50	108	4	0.25	0.50	8		12
390710	63 PERU	12	1.42	0.90	67	4	0.50	1.00	15		12
390711	63 PERU	4	3.50	0.58	117	4	1.00	0.82	31		12
390712	63 PERU	4	3.00	0.00	100	4	0.75	1.50	23		12
390713	63 PERU	4	3.25	0.50	108	4	2.75	0.50	85		12
390714	63 PERU	4	2.75	0.50	92	4	1.00	1.15	31		12
390715	63 PERU	2	3.00	0.00	100	4	2.25	0.50	69		12
390716	63 PERU	3	3.67	0.58	122	4	0.50	1.00	15		12
390717	63 PERU	2	3.00	0.00	100	4	0.50	0.58	17		12
390718	63 PERU	3	3.00	0.00	100	4	0.00	0.00	0		12
390719	63 PERU	3	3.33	0.58	111	4	0.00	0.00	0		12
390720	63 PERU	3	3.33	0.58	111	4	0.00	0.00	0		12
390721	63 PERU	4	3.25	0.50	108	4	0.75	1.50	25		12
390722	63 PERU	4	3.00	0.00	100	4	1.75	1.26	58		12
390723	63 PERU	4	3.00	0.00	100	4	0.25	0.50	8		12
390724	63 PERU	4	2.50	1.00	83	4	2.25	0.96	75		12
390725	63 PERU	4	2.75	0.50	92	4	0.00	0.00	0		12
390726	63 PERU	12	1.92	1.00	92	4	0.00	0.00	0		12
390727	63 PERU	4	4.00	0.00	133	4	0.00	0.00	0		12
390728	63 PERU	4	3.25	0.96	108	4	0.00	0.00	0		12
390729	63 PERU	3	2.67	0.58	89	4	0.00	0.00	0		12
390730	63 PERU	12	1.50	0.67	68	4	0.00	0.00	0		12
390731	63 PERU	7	1.43	0.98	64	4	0.00	0.00	0		12
390732	63 PERU	2	2.50	0.71	107	4	0.00	0.00	0		12
390733	63 PERU	8	1.75	0.46	82	4	0.25	0.50	13		12
390734	63 PERU	8	1.75	0.71	81	4	0.00	0.00	0		12
390735	63 PERU	4	3.00	0.82	129	4	0.00	0.00	0		12
390736	63 PERU	4	3.25	0.50	139	4	0.00	0.00	0		12
390737	63 PERU	4	2.50	0.58	107	4	0.00	0.00	0		12
390738	63 PERU	4	2.50	0.58	107	4	0.00	0.00	0		12
390739	63 PERU	4	2.50	0.58	83	4	0.50	0.58	25		12
390741	63 PERU	12	1.92	0.90	90	4	0.25	0.50	13		12
390742	63 PERU	4	2.50	0.58	83	4	0.00	0.00	0		12

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
390745	63 PERU	4	2.50	0.58	83	4	0.00	0.00	0		12
390746	63 PERU	4	3.00	0.00	100	4	0.75	0.96	33		12
390747	63 PERU	4	3.00	0.00	100	4	0.00	0.00	0		12
390748	63 PERU	4	3.00	0.00	100	4	0.00	0.00	0		12
390749	63 PERU	3	2.67	0.58	89	4	1.50	1.00	67		12
390750	63 PERU	4	4.00	0.00	123	4	0.00	0.00	0		12
390751	63 PERU	4	2.75	0.50	85	4	0.00	0.00	0		12
390752	63 PERU	4	3.25	0.50	100	4	0.25	0.50	9		12
391604	15 CHINA	4	3.25	0.50	100					524 TA-HUNG	17
391605	15 CHINA	4	2.75	0.50	85					HEI-YUAN #3	17
391606	15 CHINA	4	2.75	0.50	85					KIRIN-TA-T'AO'	17
391607	16 CHINA, PRC	4	3.50	0.58	108					NUNG-TA #23	17
391608	16 CHINA, PRC	4	3.00	0.00	92					NUNG-TA #24	17
391609	16 CHINA, PRC	3	3.00	0.00	109					PAI-LIANG-HUANG	17
391610	16 CHINA, PRC	4	2.75	0.50	100					TA-HUANG #1	17
391611	16 CHINA, PRC	4	2.50	0.58	91					TSAO-FEN #2	17
391612	16 CHINA, PRC	3	3.00	0.00	109					35-26	17
391613	16 CHINA, PRC	4	3.25	0.50	118					71-23 FEN	17
391614	16 CHINA, PRC	4	3.50	0.58	127					74-1 H.F1	17
391615	16 CHINA, PRC	4	3.00	0.00	109					72-2 H.F1	17
391616	16 CHINA, PRC	3	3.00	0.00	109					CHU-HUANG-FANG-CH'IEH	17
391617	16 CHINA, PRC	4	3.25	0.50	108					TA-YUAN-CH'IEH	17
393491	29 FRANCE	4	3.25	0.50	108					ROI HUMBERT	17
393953	29 FRANCE	4	3.00	0.00	100						17
393954	29 FRANCE	4	3.50	0.58	117						17
393955	29 FRANCE	4	3.50	0.58	117					LYCOPREA	17
399461	11 CANADA	3	3.67	0.58	122						17
399462	11 CANADA	4	3.00	0.00	100						17
401735	22 CZECHOSLOVAKIA	4	3.50	0.58	117						17
401736	22 CZECHOSLOVAKIA	3	3.33	0.58	111						17
401737	22 CZECHOSLOVAKIA	4	3.25	0.50	108						17
401738	22 CZECHOSLOVAKIA	4	3.50	0.58	117						17
401739	22 CZECHOSLOVAKIA	3	3.00	0.00	100						17
401764	11 CANADA	3	3.00	0.00	100						17
401767	11 CANADA	3	3.00	0.00	100						17
401768	11 CANADA	7	2.57	0.79	89						17
401769	11 CANADA	3	3.00	0.00	92						17
401770	11 CANADA	4	3.00	0.82	92						17
406750	20 COSTA RICA	4	3.25	0.50	100						17
406751	20 COSTA RICA	4	3.00	0.00	92						17
406752	20 COSTA RICA	4	3.25	0.50	100						17
406753	20 COSTA RICA	4	3.00	0.00	92						17
406754	20 COSTA RICA	4	2.50	0.58	77						17
406755	20 COSTA RICA	4	3.75	0.50	100						17
406756	20 COSTA RICA	4	3.50	0.58	93						17
406757	20 COSTA RICA	4	4.00	0.00	107						17
406758	20 COSTA RICA	4	3.50	0.58	93						17
406759	20 COSTA RICA	4	3.75	0.50	100						17
406760	20 COSTA RICA	4	3.50	0.58	93						17
406761	20 COSTA RICA	4	3.00	0.00	80						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
406762	20 COSTA RICA	4	3.50	0.58	93						17
406763	20 COSTA RICA	4	3.50	0.58	117						17
406764	20 COSTA RICA	4	2.75	0.50	92						17
406765	20 COSTA RICA	4	3.25	0.50	108						17
406766	20 COSTA RICA	4	3.50	0.58	117						17
406767	20 COSTA RICA	4	4.00	0.00	123						17
406768	20 COSTA RICA	4	3.00	0.00	92						17
406769	20 COSTA RICA	3	3.00	0.00	92						17
406770	20 COSTA RICA	4	3.00	0.00	92						17
406771	20 COSTA RICA	4	4.00	0.00	123						17
406772	20 COSTA RICA	4	3.25	0.50	100						17
406773	20 COSTA RICA	4	2.75	0.50	85						17
406774	20 COSTA RICA	4	2.75	0.50	85						17
406775	20 COSTA RICA	4	3.00	0.00	100						17
406776	20 COSTA RICA	4	3.00	0.00	100						17
406777	20 COSTA RICA	4	2.75	0.50	92						17
406778	20 COSTA RICA	3	3.00	0.00	100						17
406779	20 COSTA RICA	4	3.50	0.58	117						17
406780	20 COSTA RICA	4	3.25	0.50	108						17
406781	20 COSTA RICA	3	3.00	0.00	100						17
406782	20 COSTA RICA	4	3.50	0.58	117						17
406783	20 COSTA RICA	4	3.00	0.00	100						17
406797	36 GUATEMALA	4	2.75	0.50	92						17
406800	26 EL SALVADOR	4	3.00	0.00	100						17
406801	26 EL SALVADOR	4	3.00	0.00	100						17
406802	26 EL SALVADOR	4	2.50	0.58	83						17
406803	26 EL SALVADOR	4	2.50	0.58	83						17
406804	26 EL SALVADOR	4	3.00	0.00	100						17
406805	26 EL SALVADOR	7	2.57	0.53	92						17
406806	26 EL SALVADOR	4	2.75	0.50	92						17
406807	26 EL SALVADOR	4	2.75	0.50	92						17
406808	26 EL SALVADOR	4	3.00	0.00	100						17
406809	26 EL SALVADOR	4	3.50	0.58	117						17
406810	26 EL SALVADOR	4	2.75	0.50	92						17
406811	26 EL SALVADOR	4	3.00	0.00	100						17
406812	26 EL SALVADOR	4	3.25	0.96	108						17
406813	26 EL SALVADOR	4	3.00	0.00	100						17
406814	26 EL SALVADOR	4	3.00	0.00	92						17
406815	26 EL SALVADOR	4	2.75	0.50	85						17
406816	26 EL SALVADOR	4	2.50	0.58	77						17
406817	26 EL SALVADOR	4	2.50	0.58	77						17
406818	26 EL SALVADOR	4	3.00	0.00	92						17
406819	26 EL SALVADOR	7	2.14	0.69	75						17
406820	26 EL SALVADOR	4	2.50	0.58	77						17
406821	26 EL SALVADOR	8	2.50	0.53	85						17
406822	26 EL SALVADOR	4	2.75	0.50	110						17
406823	26 EL SALVADOR	4	2.50	0.58	100						17
406824	26 EL SALVADOR	4	3.00	0.82	120						17
406825	26 EL SALVADOR	4	3.25	0.50	130						17
406826	26 EL SALVADOR	4	3.00	0.00	120						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
406827	26 EL SALVADOR	4	2.75	0.50	110						17
406828	26 EL SALVADOR	4	3.00	0.00	120						17
406829	26 EL SALVADOR	4	3.25	0.50	130						17
406830	26 EL SALVADOR	4	3.25	0.50	108						17
406831	26 EL SALVADOR	4	3.25	0.50	108						17
406832	26 EL SALVADOR	3	3.33	0.58	111						17
406833	26 EL SALVADOR	4	3.25	0.50	108						17
406834	26 EL SALVADOR	3	3.00	0.00	100						17
406835	26 EL SALVADOR	4	2.75	0.50	92						17
406836	26 EL SALVADOR	4	3.50	0.58	117						17
406837	26 EL SALVADOR	4	3.00	0.00	100						17
406838	26 EL SALVADOR	4	2.75	0.50	92						17
406858	37 HONDURAS	4	3.00	0.00	100						17
406859	37 HONDURAS	4	3.00	0.00	100						17
406860	37 HONDURAS	4	3.00	0.00	100						17
406861	37 HONDURAS	3	3.00	0.00	100						17
406862	37 HONDURAS	4	3.00	0.00	100						17
406863	37 HONDURAS	4	3.50	0.58	117						17
406864	37 HONDURAS	4	3.25	0.50	108						17
406865	37 HONDURAS	4	2.75	0.50	92						17
406866	37 HONDURAS	4	3.00	0.00	100						17
406867	37 HONDURAS	4	3.00	0.00	100						17
406868	37 HONDURAS	8	2.38	0.92	84						17
406869	37 HONDURAS	4	2.75	0.50	92						17
406870	37 HONDURAS	4	3.00	0.00	100						17
406871	37 HONDURAS	4	3.00	0.00	100						17
406872	37 HONDURAS	4	2.75	0.50	92						17
406873	37 HONDURAS	3	3.00	0.00	100						17
406874	37 HONDURAS	4	3.50	1.00	117						17
406875	37 HONDURAS	4	3.00	0.00	100						17
406876	37 HONDURAS	4	3.00	0.00	100						17
406877	37 HONDURAS	4	3.50	0.58	117						17
406878	37 HONDURAS	4	3.00	0.00	100						17
406879	37 HONDURAS	4	3.25	0.50	108						17
406880	37 HONDURAS	4	2.50	0.58	83						17
406881	37 HONDURAS	4	3.00	0.00	100						17
406882	37 HONDURAS	4	3.00	0.00	100						17
406883	37 HONDURAS	4	3.00	0.00	100						17
406884	37 HONDURAS	4	3.25	0.50	108						17
406885	37 HONDURAS	4	3.00	0.00	100						17
406886	37 HONDURAS	4	3.00	0.00	100						17
406887	37 HONDURAS	4	3.00	0.00	100						17
406888	37 HONDURAS	4	3.50	0.58	117						17
406889	37 HONDURAS	4	3.00	0.00	100						17
406890	37 HONDURAS	4	2.75	0.50	92						17
406891	37 HONDURAS	4	3.00	0.00	100						17
406892	37 HONDURAS	4	3.00	0.00	100						17
406893	37 HONDURAS	4	3.00	0.00	100						17
406894	37 HONDURAS	4	2.50	0.58	83						17
406895	37 HONDURAS	4	3.00	0.00	100						17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
406896	37 HONDURAS	4	3.25	0.50	108						17
406897	37 HONDURAS	4	3.00	0.00	100						17
406898	37 HONDURAS	4	3.00	0.00	100						17
406899	37 HONDURAS	4	2.75	0.50	92						17
406900	37 HONDURAS	4	2.75	0.50	92						17
406901	37 HONDURAS	4	2.75	0.50	92						17
406902	37 HONDURAS	4	2.50	0.58	83						17
406903	37 HONDURAS	7	2.00	0.58	72						17
406904	37 HONDURAS	4	3.00	0.00	100						17
406905	37 HONDURAS	4	3.00	0.00	100						17
406906	37 HONDURAS	4	3.00	0.00	100						17
406907	37 HONDURAS	4	3.00	0.00	100						17
406908	37 HONDURAS	4	3.50	0.58	117						17
406909	37 HONDURAS	4	3.00	0.00	100						17
406910	37 HONDURAS	4	3.00	0.00	100						17
406911	37 HONDURAS	4	2.75	0.50	92						17
406912	37 HONDURAS	4	2.75	0.50	92						17
406913	37 HONDURAS	3	3.00	0.00	92						17
406914	37 HONDURAS	4	3.00	0.00	92						17
406915	37 HONDURAS	4	3.00	0.00	92						17
406916	37 HONDURAS	4	3.25	0.50	100						17
406917	37 HONDURAS	4	3.00	0.00	92						17
406918	37 HONDURAS	4	3.00	0.00	92						17
406919	37 HONDURAS	3	2.67	0.58	82						17
406920	37 HONDURAS	4	3.25	0.50	100						17
406921	37 HONDURAS	4	3.00	0.00	100						17
406922	37 HONDURAS	4	3.00	0.00	100						17
406923	37 HONDURAS	4	2.75	0.50	92						17
406924	37 HONDURAS	4	3.50	0.58	117						17
406925	37 HONDURAS	4	3.00	0.00	100						17
406926	37 HONDURAS	4	3.00	0.00	100						17
406927	37 HONDURAS	4	3.25	0.50	108						17
406928	37 HONDURAS	4	3.25	0.50	108						17
406929	37 HONDURAS	4	3.00	0.00	86						17
406930	37 HONDURAS	4	3.00	0.00	86						17
406931	37 HONDURAS	4	3.00	0.00	86						17
406932	37 HONDURAS	4	3.00	0.00	86						17
406933	37 HONDURAS	4	3.00	0.00	86						17
406934	37 HONDURAS	7	2.57	0.53	84						17
406952	58 NICARAGUA	4	3.25	0.50	93						17
406953	58 NICARAGUA	4	3.75	0.50	107						17
406954	58 NICARAGUA	4	3.25	0.50	100						17
406955	58 NICARAGUA	4	3.00	0.00	92						17
406956	58 NICARAGUA	4	2.50	0.58	77						17
406957	58 NICARAGUA	4	2.50	0.58	77						17
406958	58 NICARAGUA	4	3.00	0.00	109						17
406959	58 NICARAGUA	4	3.00	0.00	109						17
406960	58 NICARAGUA	4	3.00	0.00	109						17
406961	58 NICARAGUA	4	3.00	0.00	109						17
406963	58 NICARAGUA	4	3.25	0.50	118						17

PI CODE		SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
406964	58	NICARAGUA	4	3.25	0.50	118						17
406965	58	NICARAGUA	4	2.75	0.50	100						17
406966	58	NICARAGUA	4	3.00	0.00	109						17
406967	58	NICARAGUA	3	3.33	0.58	95						17
406968	58	NICARAGUA	4	3.25	0.50	93						17
406969	58	NICARAGUA	4	3.25	0.50	93						17
406970	58	NICARAGUA	4	3.50	0.58	100						17
406971	58	NICARAGUA	4	3.25	0.50	93						17
406972	58	NICARAGUA	4	2.75	0.50	79						17
406973	58	NICARAGUA	4	3.50	0.58	100						17
406974	58	NICARAGUA	4	3.00	0.82	86						17
406975	58	NICARAGUA	4	3.50	0.58	117						17
406976	58	NICARAGUA	4	3.25	0.50	108						17
406978	58	NICARAGUA	4	3.00	0.00	100						17
406979	58	NICARAGUA	4	3.50	0.58	117						17
406980	58	NICARAGUA	4	3.50	0.58	117						17
406981	58	NICARAGUA	4	3.75	0.50	125						17
406982	58	NICARAGUA	4	3.00	0.00	100						17
406990	62	PANAMA	4	3.50	0.58	117						17
406991	62	PANAMA	4	3.00	0.00	100						17
406992	62	PANAMA	4	3.25	0.50	108						17
406993	62	PANAMA	4	3.50	0.58	117						17
406994	62	PANAMA	4	3.00	0.00	100						17
406995	62	PANAMA	4	3.25	0.50	108						17
406996	62	PANAMA	4	3.00	0.00	100						17
406997	62	PANAMA	4	2.75	0.50	92						17
406998	62	PANAMA	4	3.00	0.00	100						17
406999	62	PANAMA	4	3.25	0.50	108						17
407000	62	PANAMA	4	3.00	0.00	100						17
407001	62	PANAMA	4	3.25	0.50	108						17
407002	62	PANAMA	3	3.67	0.58	122						17
407003	62	PANAMA	4	3.25	0.50	108						17
407004	62	PANAMA	4	3.25	0.50	108						17
407005	62	PANAMA	4	3.25	0.50	108						17
407006	62	PANAMA	8	2.38	0.52	83						17
407007	62	PANAMA	4	3.00	0.00	100						17
407008	62	PANAMA	4	3.00	0.00	100						17
407009	62	PANAMA	4	3.25	0.50	108						17
407010	62	PANAMA	4	3.50	0.58	117						17
407011	62	PANAMA	4	3.00	0.00	100						17
407012	62	PANAMA	4	3.00	0.00	100						17
407013	62	PANAMA	4	3.00	0.00	100						17
407014	62	PANAMA	4	3.25	0.50	108						17
407015	62	PANAMA	4	3.25	0.50	108						17
407016	62	PANAMA	4	2.75	0.50	92						17
407430	20	COSTA RICA	8	2.50	0.53	104						17
407431	1		8	3.00	0.00	100						18
407432	20	COSTA RICA	4	3.00	0.00	100						17
407433	62	PANAMA	4	3.00	0.00	100						17
407436	4	AUSTRALIA	4	3.00	0.82	100					COLLEGE ABUNDANT	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
407437	4 AUSTRALIA	4	3.00	0.00	100					COLLEGE CHALLENGER	17
407438	4 AUSTRALIA	4	3.25	0.50	100					COLLEGE CONQUEST	17
407439	4 AUSTRALIA	4	3.25	0.50	100					COLLEGE CROPWELL	17
407440	4 AUSTRALIA	4	3.00	0.00	92					COLLEGE GLOBE	17
407441	4 AUSTRALIA	4	3.25	0.50	100					COLLEGE RED	17
407442	4 AUSTRALIA	4	3.25	0.50	100					COLLEGE REGAL	17
407443	8 BRAZIL	4	3.50	0.58	108					ANGELA	17
407445	10 BULGARIA	4	3.00	0.00	92					DRUZHBA	17
407446	10 BULGARIA	4	3.25	0.50	100					ISOBILIE	17
407448	10 BULGARIA	4	3.25	0.50	108					OGOSTA	17
407449	10 BULGARIA	4	3.00	0.00	100					PIONEER 2	17
407532	63 PERU	4	3.00	0.00	100						17
407533	63 PERU	4	2.75	0.50	92	4	0.00	0.00	0		12
407534	63 PERU	4	3.00	0.00	100	4	0.00	0.00	0		12
407535	63 PERU	4	3.00	0.00	100	4	0.00	0.00	0		12
407536	63 PERU	4	3.50	0.58	117	4	1.00	1.15	36		12
407537	63 PERU	4	3.00	0.00	100	4	0.75	1.50	27		12
407538	63 PERU	4	3.00	0.00	100	4	0.00	0.00	0		12
407539	63 PERU	4	3.00	0.00	100	3	1.00	1.73	36		12
407540	63 PERU	3	3.33	0.58	111	4	0.00	0.00	0		12
407541	63 PERU	4	3.25	0.50	108	4	0.50	0.58	17		12
407542	63 PERU	4	3.00	0.00	100	4	0.50	1.00	17		12
407543	63 PERU	4	3.00	0.00	100	4	0.75	0.50	25		12
407544	63 PERU	4	3.00	0.00	100	4	1.50	0.58	50		12
407545	63 PERU	4	3.25	0.50	108	4	2.00	0.00	67		12
407546	63 PERU	4	3.00	0.00	100	4	2.25	0.50	75		12
407547	63 PERU	4	3.00	0.00	100	4	1.25	0.50	42		12
407548	63 PERU	4	3.00	0.00	100	3	2.67	0.58	97		12
407549	63 PERU	4	3.00	0.00	100	4	0.25	0.50	9		12
407550	63 PERU	4	3.00	0.00	100	4	0.25	0.50	9		12
407551	63 PERU	4	3.00	0.00	100	4	0.50	0.58	18		12
407552	63 PERU	8	2.63	0.52	110	4	0.00	0.00	0		12
407553	63 PERU	8	1.75	0.71	69	4	0.25	0.50	9		12
407554	63 PERU	4	3.00	0.00	100	4	0.00	0.00	0		12
407555	63 PERU	4	3.25	0.50	108	4	0.50	0.58	18		12
407556	63 PERU	4	3.00	0.00	100	4	0.00	0.00	0		12
407557	63 PERU	4	3.00	0.00	100	4	0.00	0.00	0		12
407558	63 PERU	4	3.00	0.00	100	4	0.00	0.00	0		12
408970	39 INDIA	4	3.25	0.50	108					PUSA RUBY	17
408971	39 INDIA	4	2.75	0.50	92						17
409015	8 BRAZIL	4	3.00	0.00	100	4	3.00	0.00	100	ANGELA IAC 3946	17
409016	8 BRAZIL	4	3.50	0.58	117					ANGELA L. C. GIGANTE	17
409017	17 CHINA, TAIWAN	4	3.00	0.00	100					VC 11-1-2-1A	17
409018	17 CHINA, TAIWAN	4	3.25	0.50	108					DIVISORIA -2	17
409019	17 CHINA, TAIWAN	4	2.75	0.50	92						17
409020	17 CHINA, TAIWAN	4	3.50	0.58	100					NAGCARLAN	17
409021	17 CHINA, TAIWAN	4	3.25	0.50	93					TINY TIM	17
410408	29 FRANCE	4	3.00	0.00	86					PIERALINE	17
410948	26 EL SALVADOR	6	2.50	0.55	98						17
413720	54 NETHERLANDS	4	3.50	0.58	100					BEAUTY	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
413721	54 NETHERLANDS	4	3.00	0.00	86					CANTATE	17
413722	54 NETHERLANDS	4	3.00	0.00	86					FORTOS V. F.	17
413723	54 NETHERLANDS	4	3.25	0.50	93					FUGA	17
413724	54 NETHERLANDS	4	3.50	0.58	131					HAPPY	17
413725	54 NETHERLANDS	4	2.75	0.50	103					RONDO	17
413726	54 NETHERLANDS	4	3.00	0.00	113					STACOS V. F.	17
413787	8 BRAZIL	4	3.00	0.00	113						17
413788	8 BRAZIL	4	3.00	0.00	113						2
413789	8 BRAZIL	4	3.50	0.58	131						2
414160	11 CANADA	4	3.00	0.00	113					V-593	17
414161	11 CANADA	4	3.00	0.00	113					V-543	17
414162	51 MEXICO	4	3.00	0.00	109						17
414163	51 MEXICO	4	2.75	0.50	100						17
414164	51 MEXICO	8	2.50	0.53	111						17
414165	51 MEXICO	4	2.50	0.58	91						17
414166	80 USSR	4	3.50	0.58	127					DONECKIJ	17
414167	80 USSR	4	3.00	0.00	109					KROSS	17
414168	80 USSR	4	2.75	0.50	100					KROSS	17
414169	80 USSR	4	2.75	0.50	100					SURPRIZ	17
414170	80 USSR	4	2.75	0.50	100					KOLHOZNYJ	17
414171	80 USSR	4	3.00	0.00	109					NEVSKIJ	17
414172	80 USSR	8	1.38	0.52	62					KUBANSKY STAMBOVOIZ	17
414173	80 USSR	8	1.50	0.76	68					PODAROK	17
414174	63 PERU	4	2.00	0.82	73						17
415127	26 EL SALVADOR	3	2.67	0.58	97					CRIOLLA DE QUETZALTEPEQUE	7
415128	26 EL SALVADOR	4	2.00	0.82	73					FIESTA	17
415785	8 BRAZIL	8	1.63	0.74	74					SANTA CRUZ KADA	17
418968	16 CHINA, PRC	4	2.75	0.50	92					HEMG NU HSING (RED OX HEART)	17
418969	16 CHINA, PRC	4	3.00	0.00	100					TAIWAN RED	17
418991	16 CHINA, PRC	3	3.00	0.00	100					NO. 2	17
418992	16 CHINA, PRC	4	2.75	0.50	92					NO. 12	17
418993	16 CHINA, PRC	4	2.75	0.50	92					NO. 13	17
418994	16 CHINA, PRC	4	2.75	0.50	92						17
418995	16 CHINA, PRC	4	2.50	0.58	83						17
419011	16 CHINA, PRC	4	3.00	0.00	100					NO. 220	17
419012	16 CHINA, PRC	3	2.00	0.00	73					TAISHAN NO. 1	17
419013	16 CHINA, PRC	4	2.25	0.50	82					TAISHAN NO. 3	17
419029	16 CHINA, PRC	4	2.75	0.50	100					LU-FEN NO. 1	17
419046	16 CHINA, PRC	4	2.75	0.50	100					CHIHONG NO. 1	17
419047	16 CHINA, PRC	3	2.00	0.00	73					CHIKIANG 101	17
419048	16 CHINA, PRC	8	2.25	0.71	87					22-66 X PEKING TSAOHONG	17
419092	16 CHINA, PRC	4	3.00	0.00	109					NONG-TA 23	17
419093	16 CHINA, PRC	4	2.75	0.50	100					NONG-TA 24	17
419094	16 CHINA, PRC	4	3.00	0.00	100					TA HWANG 1	17
419111	16 CHINA, PRC	4	2.75	0.50	92					PEKING FEN NO. 1	17
419112	16 CHINA, PRC	4	2.75	0.50	92					PEKING FEN NO. 2	17
419113	16 CHINA, PRC	4	3.00	0.00	100					PEKING FEN 76012	17
419142	16 CHINA, PRC	4	3.00	0.00	100					AICHI TAHONG	17
419143	16 CHINA, PRC	4	3.00	0.00	100					CHIALI AICHONG	17
419144	16 CHINA, PRC	4	2.75	0.50	92					CHIALI CHANGHUNG	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
419145	16 CHINA, PRC	4	2.00	0.00	67					SUKONG, TSAO FENG'	17
419146	16 CHINA, PRC	4	3.00	0.00	109					TAHONG	17
419147	16 CHINA, PRC	4	2.75	0.50	100					TSAO X CHIU	17
419148	16 CHINA, PRC	4	2.50	0.58	91					TSAO X KU	17
419149	16 CHINA, PRC	4	2.25	0.96	82					TSAO X TAI	17
419185	16 CHINA, PRC	4	2.50	0.58	91					PEKING TSAO HUNG	17
419187	16 CHINA, PRC	4	3.00	0.00	109					PU HUNG 2	17
419188	16 CHINA, PRC	4	1.75	0.50	64					PU HUNG 3	17
419189	16 CHINA, PRC	4	2.75	0.50	100					PU HUNG 4	17
419190	16 CHINA, PRC	4	2.50	0.58	100					PU HUNG 5	17
419191	16 CHINA, PRC	4	2.25	0.50	90					PU HUNG 6	17
419192	16 CHINA, PRC	4	2.50	0.58	100					PU HUNG 7	17
419193	16 CHINA, PRC	4	2.25	0.50	90					PU HUNG 8	17
419194	16 CHINA, PRC	4	3.00	0.00	120					PU HUNG 9	17
419203	16 CHINA, PRC	3	1.67	0.58	67						17
424784	1	4	1.75	0.50	70						18
424785	1	4	3.00	0.00	109						18
427096	16 CHINA, PRC	4	1.75	0.50	70					CH'ANG-CH'UN NO. 2	17
427097	16 CHINA, PRC	4	2.75	0.50	100					CH'ANG-CH-UN NO. 3	17
432910	16 CHINA, PRC	4	3.00	0.00	109					4-1812	17
432911	16 CHINA, PRC	4	3.00	0.00	109					2-9181	17
432912	16 CHINA, PRC	4	3.00	0.00	109					1-5268	17
432913	16 CHINA, PRC	4	1.75	0.50	64					7-5268	17
432914	16 CHINA, PRC	4	2.50	0.58	91					2-1611	17
432915	16 CHINA, PRC	3	2.67	0.58	97					2-1118	17
432916	16 CHINA, PRC	4	3.00	0.00	100					2-9126	17
432917	16 CHINA, PRC	4	3.00	0.00	100					2-2467	17
432918	16 CHINA, PRC	4	3.00	0.00	100					2-4129	17
432919	16 CHINA, PRC	4	3.00	0.00	100					2-1537	17
432920	16 CHINA, PRC	4	3.00	0.00	100					4-2418	17
432921	16 CHINA, PRC	3	3.00	0.00	100					4-2215	17
432922	16 CHINA, PRC	4	3.25	0.50	108					4-3349	17
432923	16 CHINA, PRC	4	3.25	0.50	108					19-8486	17
432924	16 CHINA, PRC	4	2.75	0.50	100					21-3111	17
432925	16 CHINA, PRC	4	3.00	0.00	109					20-4168	17
432926	16 CHINA, PRC	4	3.00	0.00	109					20-1517	17
432927	16 CHINA, PRC	4	3.50	0.58	127					20-1113	17
432928	16 CHINA, PRC	8	2.25	0.46	86					20-2438	17
432929	16 CHINA, PRC	3	3.00	0.00	109					19-1401	17
432930	16 CHINA, PRC	4	3.00	0.00	109					19-1751	17
432931	16 CHINA, PRC	4	3.00	0.00	109					19-136	17
432932	16 CHINA, PRC	4	3.00	0.00	92					19-543	17
432933	16 CHINA, PRC	4	3.00	0.00	92					HOLLAND 5-1164	17
432934	16 CHINA, PRC	4	3.00	0.00	92					HOLLAND 5-4113	17
432935	16 CHINA, PRC	4	3.00	0.00	92					HOLLAND 6-136	17
432936	16 CHINA, PRC	4	3.00	0.00	92					MANAPAL 772	17
432937	16 CHINA, PRC	3	3.33	0.58	103					MANAPAL 779	17
432938	16 CHINA, PRC	4	3.50	0.58	108					MANAPAL	17
432939	16 CHINA, PRC	4	3.00	0.00	92					MANAPAL	17
432940	16 CHINA, PRC	4	2.75	0.50	92					MANALUCIA	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
432941	16 CHINA, PRC	4	2.50	0.58	83					MANALUCIA	17
432942	16 CHINA, PRC	4	3.25	0.50	108					ZAO 2	17
432943	16 CHINA, PRC	4	3.25	0.50	108					ZAO 2-36	17
432944	16 CHINA, PRC	4	2.25	0.50	75					ZAO 2-39	17
432945	16 CHINA, PRC	4	2.50	0.58	83					ZAO FEN 2	17
432946	16 CHINA, PRC	3	3.00	0.00	100					CAMPBELL 1138	17
432947	16 CHINA, PRC	4	3.00	0.00	100					CAMPBELL	17
432948	16 CHINA, PRC	4	2.50	0.58	91					TROPIC	17
432949	16 CHINA, PRC	4	1.75	0.50	64					TROPIC	17
432950	16 CHINA, PRC	4	2.75	0.50	100					NING FEN 2	17
432951	16 CHINA, PRC	4	2.75	0.50	100					NING HONG 2	17
432952	16 CHINA, PRC	4	2.25	0.50	82					NI HONG 2	17
432953	16 CHINA, PRC	4	3.00	0.00	109					NONG DA 24	17
432954	16 CHINA, PRC	4	2.75	0.50	100					NONG DA	17
432955	16 CHINA, PRC	4	2.25	0.50	82					WALTER	17
432956	16 CHINA, PRC	4	3.00	0.00	109					GLICKR 0.36	17
432957	16 CHINA, PRC	3	3.00	0.00	109					GLICKR	17
432958	16 CHINA, PRC	4	3.25	0.50	118					CHANG JI DA HONG	17
432959	16 CHINA, PRC	4	3.50	0.58	127					CHALK EARLY JEWEL	17
432960	16 CHINA, PRC	4	3.00	0.00	109					YANG HONG	17
432961	16 CHINA, PRC	4	3.00	0.00	109					SHN YE ZAO HONG	17
432962	16 CHINA, PRC	4	3.50	0.58	127					PU HONG 1 F1	17
432963	16 CHINA, PRC	4	3.50	0.58	127					PU HONG 2 F1	17
432964	16 CHINA, PRC	4	3.00	0.00	100					PU HONG 3 F1	17
432965	16 CHINA, PRC	3	3.00	0.00	100					PU HONG 4 F1	17
432966	16 CHINA, PRC	4	3.00	0.00	100					PU HONG 5 F1	17
432967	16 CHINA, PRC	4	3.00	0.00	100					PU HONG 6 F1	17
432968	16 CHINA, PRC	4	2.25	0.50	75					TA 752	17
432969	16 CHINA, PRC	4	2.50	0.58	83					SI WE	17
432970	16 CHINA, PRC	4	2.50	0.58	83					CANADA 4	17
432971	16 CHINA, PRC	3	3.00	0.00	100					57 HONG NO. 7	17
432972	16 CHINA, PRC	4	3.00	0.00	100					LU FEN 1	17
432973	16 CHINA, PRC	4	3.00	0.00	100					JIN YIN 1	17
432974	16 CHINA, PRC	4	3.00	0.00	100					VALIANT	17
432975	16 CHINA, PRC	4	3.00	0.00	100					JIN DUI	17
432976	16 CHINA, PRC	2	4.00	0.00	133					Y NO 1	17
432977	16 CHINA, PRC	4	2.25	0.50	75					HOLLAND 87	17
432978	16 CHINA, PRC	4	2.25	0.50	75					6613	17
432979	16 CHINA, PRC	2	3.00	0.00	100					QIANG HONG 2	17
432980	16 CHINA, PRC	4	3.00	0.00	100					ITALY 10	17
432981	16 CHINA, PRC	4	3.00	0.00	100					JOHN BEAR	17
432982	16 CHINA, PRC	4	3.00	0.00	100						17
432983	16 CHINA, PRC	3	3.00	0.00	100					XAIO X 23	17
432984	16 CHINA, PRC	3	2.67	0.58	89					XAIO X H5	17
432985	16 CHINA, PRC	4	3.00	0.00	100					XAIO X TROPIC1	17
432986	16 CHINA, PRC	4	2.25	0.50	75					PEKING EARLY RED X 7501	17
432987	16 CHINA, PRC	4	2.25	0.50	75					PEKING EARLY RED	17
432989	16 CHINA, PRC	4	2.50	0.58	100					201 X MANALUCIA	17
432990	16 CHINA, PRC	4	2.50	0.58	100					MANALUCIA X 20L	17
432991	16 CHINA, PRC	3	2.33	0.58	93					201 X CHANG LI MEI SHOU	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
432992	16 CHINA, PRC	3	3.00	0.00	120					CHIANG X 201	17
432993	16 CHINA, PRC	3	2.67	0.58	107					201 X TROPIC	17
432994	16 CHINA, PRC	4	2.00	0.00	80					TROPIC X 201	17
432995	16 CHINA, PRC	4	2.00	0.00	80					201 X 524	17
432996	16 CHINA, PRC	3	1.67	0.58	67					524 X 201	17
432998	16 CHINA, PRC	4	3.25	0.50	118					COOLICANKO X 201	17
432999	16 CHINA, PRC	4	3.00	0.00	109					201 X PEKING EARLY RED	17
433000	16 CHINA, PRC	2	3.00	0.00	109					PEKING EARLY RED X 201	17
433002	16 CHINA, PRC	4	3.00	0.00	109					WALTER X 201	17
433003	16 CHINA, PRC	4	2.50	0.58	91					201 X 402	17
433004	16 CHINA, PRC	4	3.00	0.00	109					402 X 201	17
433005	16 CHINA, PRC	4	3.25	0.50	118					364 X 32	17
433006	16 CHINA, PRC	4	3.00	0.00	109					524 X 32	17
433007	16 CHINA, PRC	4	2.50	0.58	91					KANG BING 1	17
433008	16 CHINA, PRC	4	2.50	0.58	91					DA HONG QUI	17
433009	16 CHINA, PRC	4	2.00	0.00	73					KANG HONG	17
433010	16 CHINA, PRC	8	1.75	0.46	67					KANG FEN	17
433011	16 CHINA, PRC	8	1.63	0.74	63					NUORA SUPER ROMA	17
433012	16 CHINA, PRC	2	2.00	0.00	73					HEI YUAN 1	17
433013	16 CHINA, PRC	4	2.50	0.58	111					HEI YUAN 2	17
433014	16 CHINA, PRC	4	2.50	0.58	111					76-2-1	17
433015	16 CHINA, PRC	4	3.00	0.00	133					HEI YUAN 5	17
433016	16 CHINA, PRC	4	2.25	0.50	100					NEW ZEALAND PINK	17
433017	16 CHINA, PRC	4	2.50	0.58	111					G 4-2-2 F1	17
433018	16 CHINA, PRC	4	2.50	0.58	111					E 5-3-3-1 F1	17
433022	16 CHINA, PRC	4	2.50	0.58	111					G 4-6-5 F1	17
433023	16 CHINA, PRC	8	2.75	0.46	117					A 6-5-2-3	17
433024	16 CHINA, PRC	3	3.00	0.00	109					I 10-2-1	17
433025	16 CHINA, PRC	4	2.50	1.00	91					DA TAO	17
433029	16 CHINA, PRC	4	3.00	0.00	109					41 X 65	17
433030	16 CHINA, PRC	4	3.00	0.00	109					39 X 63	17
433032	16 CHINA, PRC	4	1.75	0.50	64					CAMPBELL X SWEET MEAT	17
433035	16 CHINA, PRC	4	2.00	0.00	73					5-9-19	17
433038	16 CHINA, PRC	4	2.50	0.58	91					JING YUAN FEN HONG	17
433039	16 CHINA, PRC	4	3.00	0.00	109					BULGARIA 4	17
433040	16 CHINA, PRC	4	1.75	0.50	70					QIE FEN	17
433041	16 CHINA, PRC	4	1.75	0.50	70					ZAO 2	17
433042	16 CHINA, PRC	4	2.25	0.50	90					CHANG ZA 49 X 59	17
433043	16 CHINA, PRC	4	1.75	0.50	70					7-20 X CHIANG LI MEI SHOU	17
433044	16 CHINA, PRC	4	1.75	0.50	70					71	17
433045	16 CHINA, PRC	4	2.75	0.50	110					39720	17
433046	16 CHINA, PRC	4	2.25	0.96	90					PING GUO QING	17
433047	16 CHINA, PRC	4	2.25	0.50	90					P-49-2	17
433048	16 CHINA, PRC	2	3.00	0.00	120					524 DA HONG	17
433049	16 CHINA, PRC	4	2.25	0.50	90					QIE FEN 11	17
433050	16 CHINA, PRC	4	2.50	0.58	100					ZAO SHU 2	17
433051	16 CHINA, PRC	4	2.25	0.96	90					ROMA1 FEN	17
433052	16 CHINA, PRC	4	2.00	0.00	80					9-5-18 X ROMA1 FEN	17
433053	16 CHINA, PRC	4	1.75	0.50	70					QIE F7	17
433054	16 CHINA, PRC	8	1.50	0.76	70					ZAO 2 X SWEET MEAT	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
433055	16 CHINA, PRC	7	1.29	0.76	62					HOLLAND 4	17
433056	16 CHINA, PRC	3	1.67	0.58	95					CUBA 5	17
433057	16 CHINA, PRC	4	1.75	0.50	100					23 FEN X PING	17
433058	16 CHINA, PRC	8	1.38	1.06	71					35-26	17
433059	16 CHINA, PRC	7	1.14	0.90	64					SWEET MEAT X AN ZAO	17
433060	16 CHINA, PRC	4	1.25	0.96	71					HONG DA 24 X CHANG 12	17
433061	16 CHINA, PRC	8	1.50	0.76	79					FASCIATION	17
433062	16 CHINA, PRC	8	1.38	0.52	72					CHANG LO	17
433063	16 CHINA, PRC	7	1.14	0.90	53					CHANG 95 X ZAO 2-39	17
433064	16 CHINA, PRC	4	2.75	0.50	92					12-27 X DA TAO	17
433065	16 CHINA, PRC	4	3.00	0.82	100					12-27 X ROMA 4	17
433066	16 CHINA, PRC	4	3.00	0.00	100					ACE	17
433067	16 CHINA, PRC	4	2.50	0.58	83					NING DA HONG	17
433068	16 CHINA, PRC	7	1.29	0.49	54					JIN PING	17
433069	16 CHINA, PRC	8	1.75	0.89	62					DA ZAO 41	17
433070	16 CHINA, PRC	8	1.50	0.76	53					PEKING SHN YE	17
433071	16 CHINA, PRC	8	2.00	0.76	70					CHANG ZA 40 X CHIANG LI MEI SH	17
433072	16 CHINA, PRC	4	3.25	0.50	108					9-6-23 X CHIANG LI MEI SHOU	17
433073	16 CHINA, PRC	4	3.25	0.50	108					DONG QIE	17
433074	16 CHINA, PRC	4	3.00	0.00	100					WEN NO 1	17
433075	16 CHINA, PRC	3	3.00	0.00	100					JI DA TAO	17
433076	16 CHINA, PRC	8	2.00	0.76	70					9-6-23	17
433077	16 CHINA, PRC	4	2.75	0.50	92					PING X 5919	17
433078	16 CHINA, PRC	4	2.50	0.58	83					7-20	17
433079	16 CHINA, PRC	4	3.00	0.00	100					FEN ROMA	17
433080	16 CHINA, PRC	4	1.75	0.50	58					PING-33	17
433081	16 CHINA, PRC	4	2.50	0.58	83					ZAO 2	17
433082	16 CHINA, PRC	4	3.00	0.00	100					12-28	17
433083	16 CHINA, PRC	4	3.00	0.00	100					9-5-14	17
433084	16 CHINA, PRC	8	1.38	0.52	48					11-10-23	17
433085	16 CHINA, PRC	8	1.38	0.52	48					ST X QIE	17
433086	16 CHINA, PRC	4	2.00	0.82	67					75-90	17
433087	16 CHINA, PRC	3	2.33	0.58	78					KWANGTUNG 001	17
433088	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 002	17
433089	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 003	17
433090	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 004	17
433091	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 005	17
433092	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 006	17
433093	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 007	17
433094	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 008	17
433095	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 009	17
433096	16 CHINA, PRC	4	2.50	0.58	100					KWANGTUNG 010	17
433097	16 CHINA, PRC	4	3.00	0.00	120					KWANGTUNG 011	17
433098	16 CHINA, PRC	4	2.75	0.50	110					KWANGTUNG 012	17
433099	16 CHINA, PRC	4	3.00	0.00	120					KWANGTUNG 013	17
433100	16 CHINA, PRC	4	2.25	0.96	90					KWANGTUNG 014	17
433101	16 CHINA, PRC	4	2.25	0.50	90					KWANGTUNG 015	17
433102	16 CHINA, PRC	3	3.00	0.00	120					KWANGTUNG 016	17
433103	16 CHINA, PRC	4	2.75	0.50	110					KWANGTUNG 017	17
433104	16 CHINA, PRC	4	2.75	0.50	92					KWANGTUNG 018	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
433105	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 019	17
433106	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 020	17
433107	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 021	17
433108	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 022	17
433109	16 CHINA, PRC	4	2.50	0.58	83					KWANGTUNG 023	17
433110	16 CHINA, PRC	4	2.75	0.50	92					KWANGTUNG 024	17
433111	16 CHINA, PRC	4	2.75	0.50	92					KWANGTUNG 025	17
433112	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 026	17
433113	16 CHINA, PRC	3	3.00	0.00	100					KWANGTUNG 027	17
433114	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 028	17
433115	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 029	17
433116	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 030	17
433117	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 031	17
433118	16 CHINA, PRC	4	2.25	0.50	75					KWANGTUNG 032	17
433119	16 CHINA, PRC	4	2.50	0.58	83					KWANGTUNG 033	17
433120	16 CHINA, PRC	4	3.00	0.00	109					KWANGTUNG 034	17
433121	16 CHINA, PRC	4	3.50	0.58	127					KWANGTUNG 035	17
433122	16 CHINA, PRC	3	3.00	0.00	109					KWANGTUNG 036	17
433123	16 CHINA, PRC	4	3.25	0.50	118					KWANGTUNG 037	17
433124	16 CHINA, PRC	4	3.00	0.00	109					KWANGTUNG 038	17
433125	16 CHINA, PRC	4	3.50	0.58	100					KWANGTUNG 039	17
433126	16 CHINA, PRC	4	3.00	0.00	86					KWANGTUNG 040	17
433127	16 CHINA, PRC	4	3.25	0.50	93					KWANGTUNG 041	17
433128	16 CHINA, PRC	4	3.25	0.50	93					KWANGTUNG 042	17
433129	16 CHINA, PRC	4	3.50	0.58	100					KWANGTUNG 043	17
433130	16 CHINA, PRC	4	3.00	0.00	86					KWANGTUNG 044	17
433131	16 CHINA, PRC	4	3.00	0.00	86					KWANGTUNG 045	17
433132	16 CHINA, PRC	3	2.67	0.58	76					KWANGTUNG 046	17
433133	16 CHINA, PRC	4	2.75	0.50	110					KWANGTUNG 047	17
433134	16 CHINA, PRC	3	3.00	0.00	120					KWANGTUNG 048	17
433135	16 CHINA, PRC	4	3.00	0.00	120					KWANGTUNG 049	17
433136	16 CHINA, PRC	4	3.00	0.00	120					KWANGTUNG 050	17
433137	16 CHINA, PRC	4	3.00	0.00	120					KWANGTUNG 051	17
433138	16 CHINA, PRC	4	3.50	0.58	140					KWANGTUNG 052	17
433139	16 CHINA, PRC	4	3.25	0.50	130					KWANGTUNG 053	17
433140	16 CHINA, PRC	4	3.00	0.00	120					KWANGTUNG 054	17
433141	16 CHINA, PRC	4	3.25	0.50	108					KWANGTUNG 055	17
433142	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 056	17
433143	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 057	17
433144	16 CHINA, PRC	4	2.75	0.50	92					KWANGTUNG 058	17
433145	16 CHINA, PRC	4	3.25	0.50	108					KWANGTUNG 059	17
433146	16 CHINA, PRC	4	3.50	0.58	117					KWANGTUNG 060	17
433147	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 061	17
433148	16 CHINA, PRC	4	2.75	0.50	92					KWANGTUNG 062	17
433149	16 CHINA, PRC	4	2.50	0.58	91					KWANGTUNG 063	17
433150	16 CHINA, PRC	4	1.75	0.50	64					KWANGTUNG 064	17
433151	16 CHINA, PRC	4	2.50	0.58	91					KWANGTUNG 065	17
433152	16 CHINA, PRC	4	2.75	0.50	100					KWANGTUNG 066	17
433153	16 CHINA, PRC	4	2.75	0.50	100					KWANGTUNG 067	17
433154	16 CHINA, PRC	4	2.50	0.58	91					KWANGTUNG 068	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
433155	16 CHINA, PRC	4	2.75	0.50	100					KWANGTUNG 069	17
433156	16 CHINA, PRC	4	1.75	0.50	64					KWANGTUNG 070	17
433157	16 CHINA, PRC	4	3.00	0.00	109					KWANGTUNG 071	17
433158	16 CHINA, PRC	4	3.00	0.00	109					KWANGTUNG 072	17
433159	16 CHINA, PRC	4	2.50	0.58	91					KWANGTUNG 073	17
433160	16 CHINA, PRC	4	1.75	0.96	64					KWANGTUNG 074	17
433161	16 CHINA, PRC	4	2.50	0.58	91					KWANGTUNG 075	17
433162	16 CHINA, PRC	4	2.50	0.58	91					KWANGTUNG 076	17
433163	16 CHINA, PRC	3	2.00	1.00	73					KWANGTUNG 077	17
433164	16 CHINA, PRC	8	2.00	0.76	73					KWANGTUNG 078	17
433165	16 CHINA, PRC	4	2.75	0.50	92					KWANGTUNG 079	17
433166	16 CHINA, PRC	4	2.50	0.58	83					KWANGTUNG 080	17
433167	16 CHINA, PRC	4	2.25	0.50	75					KWANGTUNG 081	17
433168	16 CHINA, PRC	3	3.00	0.00	100					KWANGTUNG 082	17
433169	16 CHINA, PRC	4	2.75	0.50	92					KWANGTUNG 083	17
433170	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 084	17
433171	16 CHINA, PRC	4	2.00	0.00	67					KWANGTUNG 085	17
433172	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 086	17
433173	16 CHINA, PRC	4	2.75	0.50	92					KWANGTUNG 087	17
433174	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 088	17
433175	16 CHINA, PRC	4	3.00	0.00	100					KWANGTUNG 089	17
433176	16 CHINA, PRC	4	2.25	0.50	75					KWANGTUNG 090	17
433177	16 CHINA, PRC	4	2.00	0.82	67					KWANGTUNG 091	17
433178	16 CHINA, PRC	4	2.50	0.58	83					KWANGTUNG 092	17
433179	16 CHINA, PRC	4	2.50	0.58	83					KWANGTUNG 093	17
433180	16 CHINA, PRC	4	2.00	0.82	67					KWANGTUNG 094	17
433181	16 CHINA, PRC	4	3.00	0.00	109					KWANGTUNG 095	17
433182	16 CHINA, PRC	4	2.50	0.58	91					KWANGTUNG 096	17
433183	16 CHINA, PRC	4	1.50	0.58	55					KWANGTUNG 097	17
433184	16 CHINA, PRC	4	2.50	0.58	91					KWANGTUNG 098	17
433185	16 CHINA, PRC	4	3.00	0.00	109					KWANGTUNG 099	17
433186	16 CHINA, PRC	4	2.75	0.50	100					KWANGTUNG 100	17
433187	16 CHINA, PRC	4	3.00	0.00	109					KWANGTUNG 101	17
433188	16 CHINA, PRC	4	1.75	0.50	64					KWANGTUNG 102	17
433189	16 CHINA, PRC	4	3.00	0.00	109					KWANGTUNG 103	17
433190	16 CHINA, PRC	4	2.00	0.00	73					KWANGTUNG 104	17
433191	16 CHINA, PRC	4	3.00	0.00	109					KWANGTUNG 105	17
433192	16 CHINA, PRC	4	2.75	0.50	100					KWANGTUNG 106	17
433193	16 CHINA, PRC	4	2.50	0.58	91					KWANGTUNG 107	17
433194	16 CHINA, PRC	4	2.25	0.50	100					KWANGTUNG 108	17
433195	16 CHINA, PRC	4	1.75	0.50	78					KWANGTUNG 109	17
433196	16 CHINA, PRC	4	3.00	0.00	133					KWANGTUNG 110	17
433197	16 CHINA, PRC	3	2.00	0.00	86					KWANGTUNG 111	17
433198	16 CHINA, PRC	3	2.33	0.58	100					KWANGTUNG 112	17
433199	16 CHINA, PRC	3	2.00	0.00	86					KWANGTUNG 113	17
433200	16 CHINA, PRC	4	2.00	0.82	86					KWANGTUNG 114	17
433201	16 CHINA, PRC	4	1.75	0.50	75					KWANGTUNG 115	17
433202	16 CHINA, PRC	4	2.75	0.50	118					KWANGTUNG 116	17
433203	16 CHINA, PRC	4	1.75	0.50	75					KWANGTUNG 117	17
433204	16 CHINA, PRC	4	1.50	0.58	64					KWANGTUNG 118	17

PI CODE	SOURCE	BACTERIAL SPOT N	M	STD	DI	BACTERIAL SPECK N	M	STD	DI	CULTIVAR	SPECIES
433205	16 CHINA, PRC	4	3.00	0.00	171					KWANGTUNG 119	17
433206	16 CHINA, PRC	4	3.00	0.00	171					KWANGTUNG 120	17
435339	79 USA MARYLAND	4	3.00	0.00	171					RBR1-75	17
435340	79 USA MARYLAND	4	3.00	0.00	171					RBR-78	17
435341	79 USA MARYLAND	4	2.25	0.96	129					R-3/3-2	17
435342	79 USA MARYLAND	4	1.75	0.50	100					R-7/3-2	17
435343	79 USA MARYLAND	4	1.50	0.58	86					R-7/6-2	17
435948	80 USSR	4	2.25	0.50	129					CROSS 525	17
435950	80 USSR	4	2.25	0.50	225					PAKEL	17
435952	80 USSR	8	1.50	0.53	101					POLYET	17
435953	80 USSR	4	1.50	0.58	150					SURPRIZ 540	17
451973	11 CANADA	16	3.00	0.00	100	12	0.08	0.28	28	SUB ARCTIC CHERRY	17

APPENDIX B.

STATISTICS BY SPECIES

Table B1. Statistics by species, all sources bulked

Population	Bacterial spot statistics			Bacterial speck statistics		
	Lines tested	Mean score	Mean DI	Lines tested	Mean score	Mean DI
Verified gene stocks	63	2.66	101	0	0.00	0
Tetraploids	15	2.35	114	1	0.18	6
Auto-diploids	4	2.15	88	0	0.00	0
Male steriles	23	2.26	100	0	0.00	0
Lycopersicon glandulosum	10	2.40	88	9	0.82	34
Lycopersicon hirsutum	15	2.87	94	13	0.11	4
Lycopersicon hirsutum f. *glabratum*	7	2.51	88	8	0.05	2
Lycopersicon peruvianum	79	2.56	96	30	0.67	29
Lycopersicon peruvianum var. *humifusum*	3	2.70	106	3	1.58	63
Lycopersicon cheesmanii f. *minor*	4	3.33	107	3	2.25	114
Lycopersicon pimpinellifolium	208	2.55	94	210	0.90	35
Lycopersicon esculentum x *Lycopersicon hirsutum*	4	2.89	94	4	1.18	43
L. esculentum x *L. peruvianum*	4	2.13	89	4	1.39	54
L. esculentum x *L. pimpinellifolium*	2	3.00	97	2	2.71	94
L. esculentum x *L. pimpinellifolium* (suspected)	157	2.69	90	153	1.96	76
L. esculentum	3826	2.67	93	100	1.75	66

APPENDIX C.

STATISTICS BY COUNTRY

Table C1. Statistics by country, all species bulked

Source	Bacterial spot statistics			Bacterial speck statistics		
	Lines tested	Mean score	Mean DI	Lines tested	Mean score	Mean DI
Afghanistan	13	2.63	90	1	2.33	117
Argentina	67	2.92	89	3	0.64	25
Australia	28	2.66	88	1	2.75	92
Balearics	1	1.75	78	0	0.00	0
Baluchistan	3	2.42	83	0	0.00	0
Bolivia	78	2.98	91	3	2.36	81
Brazil	104	2.66	88	4	2.63	95
British Guiana	1	3.25	93	0	0.00	0
Bulgaria	30	2.74	91	0	0.00	0
Canada	120	3.13	105	10	1.22	47
Canary Islands	1	2.75	79	0	0.00	0
Ceylon	1	2.00	160	0	0.00	0
Chile	59	2.15	95	5	0.10	4
China	51	2.54	85	0	0.00	0
China, PRC	334	2.59	94	0	0.00	0
China, Taiwan	10	3.38	107	0	0.00	0
Colombia	87	2.91	90	11	1.72	65
Cook Islands	2	3.00	93	0	0.00	0
Costa Rica	46	2.96	95	2	3.00	114
Cuba	6	3.00	85	0	0.00	0
Czechoslovakia	65	3.00	104	0	0.00	0
East Africa	1	3.25	108	0	0.00	0
Ecuador	141	2.90	89	58	0.78	32
Egypt	2	2.53	93	0	0.00	0
El Salvador	421	2.68	104	2	2.50	105
England	12	1.87	62	2	1.88	94
Ethiopia	17	2.50	92	2	2.56	94
France	17	2.50	90	0	0.00	0
French Guiana	13	3.18	86	2	2.13	78

Table C1. *Continued*

Source	Bacterial spot statistics			Bacterial speck statistics		
	Bacterial lines tested	Mean score	Mean DI	Bacterial lines tested	Mean score	Mean DI
Germany	17	2.73	86	2	2.33	85
Ghana	10	2.56	97	0	0.00	0
Great Britain	14	3.55	107	0	0.00	0
Greece	5	2.37	83	0	0.00	0
Guadeloupe	14	3.10	89	0	0.00	0
Guatemala	216	2.49	93	18	2.37	89
Honduras	94	2.88	97	2	2.19	88
Hungary	134	3.04	95	1	3.00	120
India	81	2.46	100	6	2.43	94
Iran	63	2.72	91	2	2.00	88
Iraq	2	2.40	93	0	0.00	0
Israel	15	2.58	96	0	0.00	0
Italy	62	2.47	120	0	0.00	0
Japan	5	2.90	100	0	0.00	0
Kenya	1	3.75	115	0	0.00	0
Lebanon	2	2.57	86	0	0.00	0
Malawi	2	3.75	116	0	0.00	0
Malaysia	6	2.22	85	5	1.00	44
Manchuria	13	2.52	92	0	0.00	0
Mexico	103	2.40	100	30	2.50	91
Morocco	16	2.70	95	3	2.17	85
Nepal	1	3.00	90	0	0.00	0
Netherlands	23	2.68	96	4	1.18	43
New Caledonia	1	2.00	62	1	2.50	100
New Guinea	1	2.42	85	0	0.00	0
New Zealand	1	3.25	93	0	0.00	0

Table C1. *Continued*

Source	Bacterial spot statistics			Bacterial speck statistics		
	Lines tested	Mean score	Mean DI	Lines tested	Mean score	Mean DI
Nicaragua	31	3.15	100	0	0.00	0
Nigeria	11	2.47	91	0	0.00	0
Norway	1	3.00	120	0	0.00	0
Palestine	2	2.50	87	0	0.00	0
Panama	40	2.78	90	1	1.25	63
Peru	420	2.50	94	222	0.88	35
Philippines	12	2.65	84	1	3.00	100
Poland	45	2.89	91	2	1.57	47
Puerto Rico	22	2.60	88	0	0.00	0
Romania	5	2.88	103	0	0.00	0
Scotland	3	2.63	92	0	0.00	0
South Africa	17	2.64	90	1	3.00	109
South America	1	4.00	133	0	0.00	0
Spain	10	2.18	93	0	0.00	0
Sweden	5	2.79	96	0	0.00	0
Switzerland	1	2.50	125	0	0.00	0
Syria	6	2.56	87	0	0.00	0
Tasmania	1	2.00	73	0	0.00	0
Thailand	5	2.83	104	0	0.00	0
Turkey	195	2.85	100	1	2.38	85
Uruguay	1	2.33	85	0	0.00	0
USA	642	2.76	97	54	1.75	70
USSR	91	2.67	97	0	0.00	0
Venezuela	26	2.16	85	14	1.93	71
West Pakistan	3	2.90	85	0	0.00	0
Yugoslavia	159	3.26	99	2	2.88	96
Zaire	1	3.33	83	0	0.00	0