

AGRICULTURE CANADA RESEARCH STATION
Harrow, Ontario

1) Another major gene for resistance to *Phytophthora megasperma* var. *sojae* in soybeans.

L62-904 has resistance (Table 1) to some races of *Phytophthora megasperma* var. *sojae* (*Pms*). L62-904 was developed by Dr. R. L. Bernard at Urbana from Harosoy⁶ x T240; it was an F₂ selection from an F₁ - BC₅ plant that was *Ps ps W₁ w₁*. It was used at Harrow as a *w₁w₁* 'Harosoy' isoline with white flowers/green hypocotyls as a genetic marker in crosses before it was discovered to have *Pms* resistance. The origin of parents used in crosses to L62-904 is given in Table 2.

Results (Tables 3, 4 and 5) indicate that L62-904 carries a single gene for resistance and that this gene is not at the *Rps₁*, *Rps₃* and *Rps₄* loci. Also, it is not at the locus of the gene in 'Altona' and the gene in 'Kingwa'. The symbol *Rps₅* is proposed for the L62-904 gene. *Rps₅* could be at the *Rps₂* locus but there is no proof that *Rps₃* (Mueller et al., 1978) and *Rps₄* (Athow et al., 1980) are not at *Rps₂* either.

Acknowledgment

The Ontario Soybean Growers' Marketing Board provided a technical helper who assisted with the inoculations.

References

- Athow, K. L., F. A. Laviolette, E. H. Mueller and J. R. Wilcox. 1980. A new major gene for resistance to *Phytophthora megasperma* var. *sojae* in soybean. *Phytopathology* 70:977-980.
- Buzzell, R. I., J. H. Haas, L. G. Crawford and O. Vaartaja. 1977. Soybean phytophthora rot in southwestern Ontario. *Plant Dis. Rep.* 57:68-70.
- Mueller, E. H., K. L. Athow and F. A. Laviolette. 1978. Inheritance of resistance to four physiologic races of *Phytophthora megasperma* var. *sojae*. *Phytopathology* 68:1318-1322.
- Ward, E. W. B., G. Lazarovits, C. H. Unwin and R. I. Buzzell. 1979. Hypocotyl reactions and glyceollin in soybeans inoculated with zoospores of *Phytophthora megasperma* var. *sojae*. *Phytopathology* 69:951-955.

Table 1
Disease reactions of soybeans in response to races of *Pms*

	Race								
	1	2	3	4	5	6-7	8	9	
L62-904	R	R	R	R	R	S	R	R	
Rps ₁	R	R	S	S	S	S	S	S	
Rps ₁ ^b	R	S	R	R	R	R	R	R	
Rps ₁ ^c	R	R	R	S	S	R	R	R	
Rps ₂	R	R	R	R	R	S	S	R	
Rps ₃	R	R	R	R	R	S	R	R	
Rps ₄	R	R	R	R	S	S	S	S	
Altona - Rps	R	R	R	R	S	S	S	S	
Kingwa - Rps	R	R	R	R	R	R	R	R	

R = Resistant

S = Susceptible

Table 2
Parents used in crosses with L62-904

<u>Harrow lines</u>	<u>Genes</u>
OX693: Harosoy 63 x Altona	"Altona - Rps"
OX696: Harosoy x Kingwa	"Kingwa - Rps"
OX708: L62-361* x Harosoy 63	Rps ₁
OX900: Blackhawk x Harosoy 63	Rps ₁
<u>Indiana lines</u> (supplied by Dr. K. L. Athow)	
PRX5-206 (Harosoy x PI 84,637)	Rps ₁ ^b
PRX8-5 (Harosoy x PI 86,972-1)	Rps ₃
<u>Other</u>	
PI 86,050 (Athow et al., 1980)	Rps ₁ ^c , Rps ₄
Sanga	Rps ₁ ^b

*Dt₂ selection from Harosoy⁶ x T117.

Table 3

F₂ segregations for an expected 3:1 ratio involving the L62-904 gene

Cross	Race	Resistant		Susceptible		Chi-square	P
		O	E	O	E		
L62-904 x OX708	3	38	43.5	20	14.5	2.30	0.20-0.10
L62-904 x OX900	3	40	43.5	18	14.5	0.83	0.40-0.30

O = Observed

E = Expected

Table 4

F₂ segregations for an expected 9:3:3:1 ratio involving Rps_1^b and the L62-904 gene

Cross	Reaction to races 2 and 6-7				Chi-square	P
	RR	RS	SR	SS		
<u>L62-904 x Sanga</u>						
Observed	59	27	21	10		
Expected	71.4	23.8	23.8	7.9	3.47	0.50-0.30
<u>L62-904 x PRX5-206*</u>						
Observed	66	18	13	10		
Expected	60.1	20.1	20.1	6.7	4.75	0.20-0.10

*PRX5-206 is (Harosoy x PI 84,637).

Table 5
 F_2 segregations for an expected 15:1 ratio involving the
 L62-904 gene and various other genes

Cross	Race	Resistant		Susceptible		Chi-square	P
		O	E	O	E		
<i>Rps</i> ₁							
L62-904 x OX708 + OX900	1	107	108.8	9	7.2	0.25	0.60-0.50
<i>Rps</i> ₃							
L62-904 x PRX8-5	4	56	55.3	3	3.7	0.12	0.80-0.70
<i>Rps</i> ₄							
L62-904 x PI86,050*	4	64	67.5	8	4.5	2.13	0.20-0.10
Altona - <i>Rps</i>							
L62-904 x OX693	4	105	103.1	5	6.9	0.30	0.60-0.50
Kingwa - <i>Rps</i>							
L62-904 x OX696	3,4,5	54	54.4	4	3.6	0.05	0.90-0.80

* F_2 seedlings inoculated as described by Ward et al. (1979); other crosses were F_3 seedling tests of F_2 plants using hypocotyl wounding/mycelium insertion (Buzzell et al., 1977).

R. I. Buzzell
 T. R. Anderson

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
 Department of Agronomy
 Urbana, IL 61801

1) An allelism study of the inheritance of the lack of soybean lectin in five soybean lines.

Pull et al. (1978) found five soybean lines ('Columbia', 'Norredo', 'Sooty', T102 and 'Wilson-5') lacking the 120,000 dalton seed lectin, also called soybean lectin (SBL). Orf et al. (1978) established that the lack of SBL is inherited as a simple recessive, *le le*. The homozygous dominant