

# Influence of Corn Gluten Meal Rate and Cultivar on Day-neutral Strawberry Production

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## Introduction

This project evaluated granular corn gluten meal (CGM) application rates and cultivar performance for day-neutral strawberry production in Iowa. CGM is a byproduct of the wet milling of corn. It provides 10% nitrogen by weight and can serve as a natural nitrogen product. Seascape is a newer day-neutral cultivar, and its adaptation to Iowa needs to be evaluated and compared with the standard Tristar and Tribute day-neutral strawberries.

## Materials and Methods

Three day-neutral strawberry cultivars and four rates of CGM as a nitrogen source were investigated at the Iowa State University Horticulture Research Station, Ames, Iowa, during the 2002–2005 growing seasons. This study has been replicated in Hungary as part of an international scientific exchange. CGM rates were similar in both countries. The Hungarian experiment used Honeoye, a Junebearing strawberry.

The experimental design was a randomized complete block. Corn gluten meal rates were investigated in the main plot and cultivars were investigated in the subplots. Dormant strawberry crowns were planted into a new site each May in years 2002–2005. Granular CGM was applied to the soil at four rates: 0 (control), 50, 100, and 200 g/m<sup>2</sup> and worked into the top inch of soil. White-on-black polyethylene soil mulch and trickle irrigation were utilized in the production system. The cultivars included Tristar, Tribute, and Seascape.

## Results and Discussion

### *Yield and plant biomass—corn gluten meal.*

Total yield and average berry weight were higher from plants receiving the 100 and 200 g/m<sup>2</sup> CGM treatment in 2005 compared with the control (Table 1). In 2005, plant leaf area was higher in the 100 and 200 g/m<sup>2</sup> CGM treatments compared with plants receiving 0 or 50 g/m<sup>2</sup> rate of CGM (Table 2).

### *Yield and plant biomass—cultivars.*

In 2005 Tristar and Tribute had the highest yields and berry numbers. Seascape had fewer, but larger, berries than Tristar and Tribute in all years (Table 3). Tribute plants were the largest and had the highest leaf area, leaf blade and petiole weight and leaf number, root dry weight, crown weight, and number (Table 4). Seascape plants had less leaf area, leaf dry weight, and root dry weight than Tristar and Tribute in 2005 (Table 4).

**Table 1. Effect of corn gluten meal (CGM) rate on strawberry yield variables, 2002-2005.<sup>z</sup>**

Rate of CGM (g/m <sup>2</sup> )	2002			2003			2004			2005		
	Total yield (g)	Berry no.	Avg. berry wt. (g)	Total yield (g)	Berry no.	Avg. berry wt. (g)	Total yield (g)	Berry no.	Avg. berry wt. (g)	Total yield (g)	Berry no.	Avg. berry wt. (g)
0	348	60	6.0	351	90	4.3	1886	291	7.07	582	105	5.85
50	606	97	6.1	439	113	4.3	1676	273	6.61	753	132	5.92
100	597	100	6.3	311	76	4.2	1906	291	7.24	872	153	5.96
200	555	87	6.6	457	109	4.7	2078	321	7.26	825	139	6.30
LSD P≤0.05	NS	NS	NS	NS	NS	0.5	281	39	0.61	188	35	0.40

<sup>z</sup>Means of four replications**Table 2. Effect of corn gluten meal (CGM) rate on strawberry plant biomass variables, 2005.<sup>z</sup>**

Rate of CGM (g/m <sup>2</sup> )	2005						
	Area (cm <sup>2</sup> )	Leaf Weight (g)	Number	Petiole Weight (g)	Root Weight (g)	Crown Weight (g)	Number
0	1904.0	19.38	47.78	5.45	2.91	5.77	4.31
50	2389.6	24.30	52.03	7.08	3.48	6.71	4.50
100	2726.6	26.21	61.06	7.83	3.14	6.73	4.97
200	2907.6	28.40	58.72	8.20	3.64	7.33	4.89
LSD P≤0.05	328.76	2.84	6.72	0.98	0.41	0.81	0.49

<sup>z</sup>Means of four replications**Table 3. Effect of strawberry cultivar on yield variables, 2002-2005.<sup>z</sup>**

Cultivar	2002			2003			2004			2005		
	Total yield (g)	Berry no.	Avg. berry wt. (g)	Total yield (g)	Berry no.	Avg. berry wt. (g)	Total yield (g)	Berry no.	Avg. berry wt. (g)	Total yield (g)	Berry no.	Avg. berry wt. (g)
Tristar	765	135	5.0	392	120	3.3	1743	314	5.52	764	152	5.07
Tribute	423	83	5.0	396	109	3.7	2340	410	5.69	880	162	5.42
Seascape	391	42	8.8	380	62	6.1	1577	158	9.93	630	84	7.54
LSD P≤0.05	219.4	32.5	1.0	NS	30.0	0.5	243	33	0.53	163	30	0.35

<sup>z</sup>Means of four replications**Table 4. Plant biomass variables for strawberry cultivars, 2005.<sup>z</sup>**

Cultivar	2005						
	Area (cm <sup>2</sup> )	Leaf Weight (g)	Number	Petiole Weight (g)	Root Weight (g)	Crown Weight (g)	Number
Tristar	2227.0	22.53	50.46	6.41	3.34	6.25	4.23
Tribute	3281.5	31.54	68.54	8.99	4.16	8.09	5.38
Seascape	1937.5	19.65	45.69	6.02	2.37	5.56	4.40
LSD P≤0.05	284.72	2.46	5.82	0.85	0.36	0.70	0.43

<sup>z</sup>Means of four replications