UNIVERSITY OF FLORIDA

Institute of Food and Agricultural Sciences
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Mulched Pepper Response to Pursell Polyon Controlled-Release Fertilizers 97-22

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Materials and Methods

Soil for the experimental area was plowed and disked and prebeds were made on four-foot centers. Plots were marked off in 25-ft lengths. Fertilizer treatments are listed in Table 1. The experiment largely consisted of evaluations o f various formulations of N, P, and K fertilizers containing various amounts of controlled-release nitrogen supplied from polymer-coated urea having various coating thickness. On 11 August 1997, fertilizer blends were spread manually on the rough beds and incorporated by rototilling. This broadcast fertilizer made up a portion of the total nutrient program with the remainder, most N from polymer-coated urea banded in bed centers between the two rows of pepper plants. Total N for all treatments except treatment 1 was 160 lb/acre N. Phosphorus was applied at 100 lbs/acre P_2O_5 and K at 120 lbs acre K_2O. Following fertilization, the beds were fumigated with 98 methyl bromide: 2 chloropicrin mixture at 350 lbs/acre and the beds immediately covered with white-on-black polyethylene mulch.

Pepper transplants 'Camelot X3R' were planted through the mulch on 18 August in two rows per bed. Plant spacing was 12 inches between rows on the bed and 12 inches between plants in a row. Drip irrigation tubing was laid in the center of the bed beneath the mulch and irrigation was done to maintain the soil moisture at -8 to -12 centibars on a tensiometer with the ceramic tip placed 8 inches deep in the soil. Diseases and insects were controlled by timely applications of labeled pesticides.

Pepper fruits were harvested on 24 October, and 7 and 24 November. Fruits were graded for size and evaluated for defects including poor shape, insufficient size, or decay. Data was analyzed by analysis of variance and treatment means compared using Least Significant Difference.

Results

Fertilizer treatments had no significant effect on pepper yield from the first harvest (Table 2). Yields with controlled-release fertilizers were equal to yields with the soluble fertilizer program. Yields with polymer-coated urea of varying coating thickness were also comparable.

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Fertilizer treatments differed in their effects on yields of extra large pepper fruits in the second harvest (Table 3). Extra large fruits are the most valuable pepper fruits. Greatest extra-large fruit yields resulted with polymer-coated urea, especially the blend of 70% PU-12 and 30% PU-6 (treatment 7). Total yield for the second harvest was unaffected by fertilizer treatment.

Total pepper yields from the third harvest were unaffected by fertilizer treatments (Table 4); however, yields of the medium sized fruits (smallest size and least valuable) were generally lower than treatments containing polymer-coated urea, especially treatments 5 and 6. The latter two treatments consisted of large proportions of N from PU-10 and PU-12. Data from harvests 2 and 3 indicated that polymer-coated N may have helped maintain a greater portion of pepper fruits in the larger-size categories.

Total season yield was not influenced by fertilizer treatment (Table 5). However, yields of larger-sized fruits were enhanced by fertilizer treatments containing polymer-coated urea, especially a blend of PU-6 and PU-12. Plants at the third harvest with treatments 1 and 2 were observed to be more chlorotic than other plants. Plants with these two treatments received the least N from polymer-coated urea.

Table 1. Fertilization treatments used in study of Pursell controlled-release fertilizer on pepper in Gainesville, FL – Fall 1997.

Trtmt No.	Fertilizer and lb per acre						Total (lb per acre)		
	Incorporated[z]			Banded[z]					
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
1	AN-180 M-20	M-100	MP-60 SP-60	-	-	-	200	100	120
2	AN-86 M-14	M-70	MP-60 SP-30	PU (10)-30 PF-30	PF-30	PF-30	160	100	120
3	AN-80 M-20	M-100	MP-60 SP-60	PU (10)-60			160	100	120
4	AN-80 M-20	M-100	MP-60 SP-60	PU (12)-60			160	100	120
5	AN-40 M-20	M-100	MP-60 SP-60	PU (10)-100			160	100	120
6	AN-40 M-20	M-100	MP-60 SP-60	PU (12)-100			160	100	120
7	AN-40 M-20	M-100	MP-60 SP-60	PU (6)-30 PU (12)-70			160	100	120
8	M-20	M-100	MP-60 SP-60	PU (10)-140			160	100	120
9	M-20	M-100	MP-60 SP-60	PU (12)-140			160	100	120
10	M-20	M-100	MP-60 SP-60	PU (6)-30 PU (12)-110			160	100	120
11	AN-10 M-10	M-50	MP-60 SP-10	PU (10)-90 PF-50	PF-50	PF-50	160	100	120

[z] Fertilizer abbreviations are:

AN – ammonium nitrate
MP – potassium chloride
SP – potassium sulfate
M – monoammonium phosphate
PU (x) – Polymer coated urea, (x) = coating weight (%).
PF – Polymer coated NPK (1-1-1 ratio).

Table 2. Yield response of pepper to various fertilizer programs involving Pursell, polymer-coated urea, Gainesville, FL – Fall 1997. First harvest.

	Pepper yield (28-lb carton per acre)				
Treatment[z]	**Ex. Large**	**Large**	**Medium**	**Total Market**	**Cull**
1	24	95	51	170	4
2	15	75	78	168	16
3	19	100	71	189	2
4	9	77	41	128	5
5	21	109	74	205	4
6	17	121	46	183	3
7	21	96	23	140	2
8	23	133	79	235	1
9	26	139	77	242	4
10	16	81	45	142	1
11	10	106	70	185	4
Signif (prob)	0.6700	0.3172	0.7448	0.4977	0.5198
LSD.05	NS	NS	NS	NS	NS

[z] Treatments described in Table 1.

Table 3. Yield response of pepper to various fertilizer programs involving Pursell, polymer-coated urea, Gainesville, FL – Fall 1997. Second harvest.

	Pepper yield (28-lb carton per acre)				
Treatment[z]	**Ex. Large**	**Large**	**Medium**	**Total Market**	**Cull**
1	8	123	109	239	0
2	2	102	103	208	0
3	5	163	139	307	0
4	6	131	124	261	0
5	9	117	103	228	0
6	14	179	168	361	0
7	30	169	131	330	0
8	0	137	75	212	0
9	16	117	90	222	0
10	3	123	128	255	0
11	3	145	137	284	0
Signif (prob)	0.0427	0.5819	0.4717	0.2709	1.0
LSD.05	NS	NS	NS	NS	NS

[z] Treatments described in Table 1.

Table 4. Yield response of pepper to various fertilizer programs involving Pursell, polymer-coated urea, Gainesville, FL – Fall 1997. Third harvest.

	Pepper yield (28-lb carton per acre)				
Treatment[z]	**Ex. Large**	**Large**	**Medium**	**Total Market**	**Cull**
1	0	82	99	181	47
2	0	57	108	165	34
3	0	126	115	241	40
4	4	123	107	234	55
5	0	107	67	174	22
6	0	109	62	171	23
7	0	160	81	241	32
8	0	143	104	247	36
9	3	115	85	202	45
10	0	109	88	197	40
11	0	127	73	200	36
Signif (prob)	0.5576	0.0884	0.0397	0.1218	0.2801
LSD.05	NS	NS	NS	NS	NS

[z] Treatments described in Table 1.

Table 5. Yield response of pepper to various fertilizer programs involving Pursell, polymer-coated urea, Gainesville, FL – Fall 1997. Season Total.

	Pepper yield (28-lb carton per acre)				
Treatment[z]	**Ex. Large**	**Large**	**Medium**	**Total Market**	**Cull**
1	32	300	258	590	51
2	17	235	289	541	50
3	23	389	324	736	42
4	19	331	272	623	59
5	30	333	243	606	26
6	30	409	276	715	26
7	51	425	235	711	34
8	23	413	258	693	37
9	44	370	252	667	49
10	19	313	261	593	42
11	12	377	280	670	39
Signif (prob)	0.0910	0.0203	0.9439	0.2432	0.4234
LSD.05	NS	NS	NS	NS	NS

[z] Treatments described in Table 1.