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Evaluation of Seed Treatments on Sweet Corn in the Columbia Basin of Washington

2009 Trial Results

Introduction: The Seed Treatment Committee of the International Sweet Corn Development Association (ISCDA) selects treatments and develops plans for a multi-location seed treatment trial annually. This program is coordinated by Dr. S. Krishna Mohan of the University of Idaho. He and other researchers from across the country evaluate the selected treatments for their effectiveness against seed-borne and soil-borne diseases that affect sweet corn stand and vigor. This multi-location trial helps sweet corn producers, seed companies, pesticide companies, pesticide registration agencies, crop advisors, plant pathologists, and others to identify the best performing seed treatments for optimum stand establishment under different growing conditions. WSU Extension and the local sweet corn industry in the Columbia Basin of Washington have participated in the multi-location seed treatment trial many years, including 2009.

Methods: A field trial was established in a center pivot irrigated field near Ephrata, WA to evaluate 28 combinations of organic and conventional seed treatments on sweet corn (var. SS Jubilee (*sh*2)). Seed treatments and rates are listed in Table 1. Treated seed was provided by the ISCDA. The seed was planted by hand on 24 April, 2009 at a depth of 1 in. One-hundred seed were planted per plot. Plots were 30-ft long rows with between-row spacing of 30 in. Treatments were replicated four times in a randomized complete block design. The trial was evaluated on 28 May, 2009 when the majority of emerged seedlings were at the 4-leaf stage. Each plot was evaluated by taking a stand count and vigor rating. Stand was expressed as a percentage of the number of seeds planted. Vigor was rated using a subjective visual rating scale of 1-5 (1=extremely weak, 2=weak, 3=fair, 4=vigorous, and 5=very vigorous). Data were subjected to an analysis of variance based on Bartlett's test. Treatment means were compared using a Student-Newman-Keuls least significant difference (LSD) at P=0.10.

Results: The first 2-3 weeks after planting were characterized by cooler than usual temperatures, which may have contributed to poor stand and vigor in the trial. On the day of evaluations (34 DAP) the majority of seedlings were at the 4-leaf stage, but some plants had just emerged and others were at the 5-leaf stage. Many seed had not emerged. The average stand for all treatments was only 59%, the best stand was 72-73%, and the worst stand was 31%. Table 2 shows mean stand and mean vigor for each of the treatments. The lowest percent stand resulted from Treatment #5. This treatment had significantly fewer emerged plants compared to Treatments #21, 25, and 8, which had the highest percent stand. Most of the treatments, however, were not significantly different in stand. None of the treatments resulted in stands that were significantly different from the untreated check. There was no significant difference in plant vigor between treatments, probably because plant vigor ratings varied greatly within treatments.

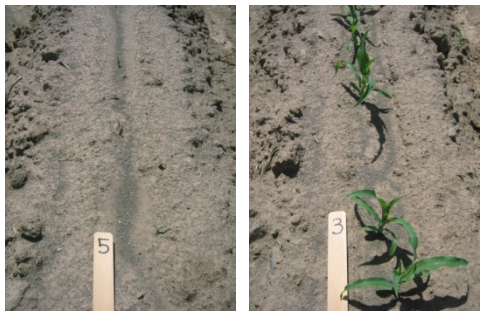

Figure 1. Sweet corn plots with the lowest (#5) and one of the highest (#3) stand counts.

Summary: Unpredictable weather conditions at planting generally make fungicide seed treatments a good investment. In this trial, the untreated check resulted in only 45% stand. Most of the seed treatments (24 out of 27) ranked higher than the untreated check for percent stand (49-73%), though the differences were not significant at the P=0.10 level. It should be noted that the three lowest ranking treatments for stand were the three treatments that included AgriCoat-Organic with T-22 and/or Yield Shield. These treatments resulted in stand counts that were less than the untreated check, though the differences were not significant at the P=0.10 level. A summary of the results from the multi-location sweet corn seed treatment trials in 2009 and other years can be obtained by contacting Carrie Wohleb at (509) 754-2011 x. 413 or at cwohleb@wsu.edu.

Table 1. Seed Treatments with Rates of Application.	
No.	
1	No Treatment
2	Dividend Extreme (difenoconazole 12 g ai/100 g + mefanoxam 3 g ai/100 kg) + Apron XL LS (8.9 g ai/100 kg) + Maxim 4FS (2.5 g ai/100 kg) + Vitavax 34 (91.3 g ai/100 kg)
3	Captan 400 (2.5 oz/cwt) + Thiram 42S (2.5 oz/cwt) + Dividend Extreme (5 oz/cwt) + Apron XL LS (0.32 oz/cwt) + Vitavax 34 (4 oz/cwt)
4	AgriCoat-Organic (4 oz/cwt) + T-22 (1.5 oz/cwt)
5	AgriCoat-Organic (4 oz/cwt) + Yield Shield (0.1 oz/cwt)
6	AgriCoat-Organic (4 oz/cwt) + T-22 (1.5 oz/cwt) + Yield Shield (0.1 oz/cwt)
7	BAS 595 XG F (20 g ai/100 kg) + Acquire (15.5 g ai/100 kg) + Stamina (10 g ai/100 kg) + Axcess (0.25 mg ai/seed)
8	BAS 595 XG F (20 g ai/100 kg) + Acquire (15.5 g ai/100 kg) + Stamina (20 g ai/100 kg) + Axcess (0.25 mg ai/seed)
9	Vortex FS (2.5 g ai/100 kg) + Allegience FS (15.5 g ai/100 kg) + Thiram 42S (39 g ai/100 kg) + Captan 400 (47 g ai/100 kg)
10	Vortex FS (2.5 g ai/100 kg) + Allegience FS (15.5 g ai/100 kg) + Trilex (15 g ai/100 kg)
11	Vortex FS (2.5 g ai/100 kg) + Allegience FS (15.5 g ai/100 kg) + Tops 30 (111 g ai/100 kg)
12	Vortex FS (2.5 g ai/100 kg) + Allegience FS (15.5 g ai/100 kg) + Thiram 42S (78 g ai/100 kg)
13	Vortex FS (2.5 g ai/100 kg) + Allegience FS (15.5 g ai/100 kg) + L0121-A (78 g ai/100 kg)
14	Vortex FS (2.5 g ai/100 kg) + Allegience FS (15.5 g ai/100 kg) + Tops 30 (111 g ai/100 kg) + Biological Combo
15	Vortex FS (2.5 g ai/100 kg) + Allegience FS (15.5 g ai/100 kg) + Tops 30 (111 g ai/100 kg) + Poncho 250 (0.25 mg ai/seed)
16	Vortex FS (2.5 g ai/100 kg) + Allegience FS (15.5 g ai/100 kg) + Thiram 42S (39 g ai/100 kg) + Captan 400 (47 g ai/100 kg) + Poncho 250 (0.25 mg ai/seed)
17	Vortex FS (2.5 g ai/100 kg) + Allegience FS (15.5 g ai/100 kg) + Thiram 42S (78 g ai/100 kg) + Poncho 250 (0.25 mg ai/seed)
18	Vortex FS (2.5 g ai/100 kg) + Allegience FS (15.5 kg ai/100 kg) + Trilex (15 g ai/100 kg) + Poncho 250 (0.25 mg ai/seed)
19	Senator 600 FS (0.6 mg ai/seed) + Sebring 2.65 ST (15.5 g ai/100 kg) + Signet (Thiram) (78 g ai/100 kg)
20	Senator 600 FS (0.6 mg ai/seed) + Sebring 2.65 ST (15.5 g ai/100 kg) + Signet (Thiram) (78 g ai/100 kg) + Maize Coat ZN + Polymer (4 oz/cwt)
21	Dividend Extreme (difenoconazole 12 g ai/100 kg + mefanoxam 3 g ai/100 kg) + Apron XL LS (8.9 g ai/100 kg) ai/100 kg) + Maxim 4FS (2.5 g ai/100 kg) + Vitavax 34 (91.3 g) + Cruiser 5FS (0.24 mg ai/seed) + Maize Coat ZN + Polymer (4 oz/cwt) + B-U 1197 (4 oz/cwt)
22	Apron XL LS (4.5 g ai/100 kg) + Dynasty 0.83 FS (1 g ai/100 kg) + Maxim 4FS (2.5 g ai/100 kg) + Cruiser 5 FS (0.25 mg ai/seed) + Dividend Extreme (15 g ai/100 kg)
23	Apron XL LS (2.5 g ai /100 kg) + A16148B (5 g ai/100 kg) + Maxim 4FS (2.5 g ai/100 kg) + Cruiser 5 FS (0.25 mg ai/seed) + Dividend Extreme (15 g ai/100 kg)
24	Tops 30 (111 g ai/100 kg) + Apron XL LS (8.9 g ai/100 kg) + Maxim 4FS (2.5 g ai/100 kg) + Vitavax 34 (91.3 g ai/100 kg)
25	Dividend Extreme (difenoconazole 12 g ai/100 kg + mefanoxam 3 g ai/100 kg) + Apron XL LS (8.9 g ai/100 kg) + Dynasty 0.83 FS (1 g ai/100 kg) + Maxim 4FS (2.5 g ai/100 kg) + Vitavax 34 (91.3 g ai/100 kg)
26	Vortex FS (2.5 g ai/100 kg) + Apron XL LS (8.9 g ai/100 kg) + Maxim 4FS (2.5 g ai/100 kg) + Vitavax 34 (91.3 g ai/100 kg)
27	Dividend Extreme (difenoconazole 12 g ai/100 kg + mefanoxam 3 g ai/100 kg) + Apron XL LS (8.9 g ai/100 kg) + Maxim 4FS (2.5 g ai/100 kg) + Vitavax 34 (91.3 g ai/100 kg) + AgriCoat Exp (over treat)
28	Dividend Extreme (difenoconazole 12 g ai/100 g + mefanoxam 3 g ai/100 kg) + Apron XL LS (8.9 g ai/100 kg) + Trilex (15 g ai/100 kg) + Vitavax 34 (91.3 g ai/100 kg)

Disclaimer: Application of a pesticide to a crop or site that is not on the label is a violation of pesticide law and may subject the applicator to civil penalties up to $7,500. In addition, such an application may also result in illegal residues that could subject the crop to seizure or embargo action by WSDA and/or the U.S. Food and Drug Administration. It is your responsibility to check the label before using the product to ensure lawful use and obtain all necessary permits in advance.

Table 2. Seed Treatment Effects on Stand and Vigor of Sweet Corn (var. SS Jubilee) in the Columbia Basin					
No.[1]	TREATMENT	STAND		VIGOR	
		%		(1-5)	
5	AgriCoat Organic + Yield Shield	31	b	2.8	a
6	AgriCoat Organic + T-22 + Yield Shield	35	ab	3.0	a
4	AgriCoat Organic + T-22	36	ab	3.0	a
1	No Treatment	45	ab	3.8	a
19	Senator 600 FS + Sebring 2.65 ST + Signet (Thiram)	49	ab	3.0	a
18	Vortex FS + Allegience FS + Trilex + Poncho 250	51	ab	2.5	a
11	Vortex FS + Allegience FS + Tops 30	56	ab	3.0	a
20	Senator 600 FS + Sebring 2.65 ST + Signet (Thiram) + Maize Coat ZN + Polymer	57	ab	3.0	a
14	Vortex FS + Allegience FS + Tops 30 + Biological Combo	58	ab	4.3	a
7	BAS 595 XG (low rate) + Acquire + Stamina + Axcess	58	ab	2.5	a
10	Vortex FS + Allegience FS + Trilex	58	ab	4.3	a
2	Dividend Extreme + Apron XL LS + Maxim 4FS + Vitavax 34	59	ab	4.0	a
28	Dividend Extreme + Apron XL LS + Trilex + Vitavax 34	59	ab	2.0	a
16	Vortex FS + Allegience FS + Thiram 42S + Captan 400 + Poncho 250	62	ab	4.3	a
17	Vortex FS + Allegience FS + Thiram 42S + Poncho 250	62	ab	3.0	a
12	Vortex FS + Allegience FS + Thiram 42 S	63	ab	4.5	a
23	Apron XL LS + A16148B + Maxim 4FS + Cruiser 5 FS + Dividend Extreme	63	ab	3.5	a
27	Dividend Extreme + Apron XL LS + Maxim 4FS + Vitavax 34 + AgriCoat Exp	64	ab	2.5	a
15	Vortex FS + Allegience FS + Tops 30 + Poncho 250	64	ab	3.8	a
9	Vortex FS + Allegience FS + Thiram 42S + Captan 400	67	ab	4.3	a
13	Vortex FS + Allegience FS + L0121-A	67	ab	3.5	a
24	Tops 30 + Apron XL LS + Maxim 4FS + Vitavax 34	68	ab	3.3	a
3	Captan 400 + Thiram 42S + Dividend Extreme + Apron XL LS + Vitavax 34	68	ab	4.0	a
22	Apron XL LS + Dynasty 0.83FS + Maxim 4FS + Cruiser 5 FS + Dividend Extreme	69	ab	3.8	a
26	Vortex FS + Apron XL LS + Maxim 4FS + Vitavax 34	70	ab	3.3	a
21	Dividend Extreme + Apron XL LS + Maxim 4FS + Vitavax 34 + Cruiser 5FS + Maize Coat ZN + Polymer + B-U 1197	72	a	3.3	a
25	Dividend Extreme + Apron XL LS + Dynasty 0.83FS + Maxim 4FS + Vitavax 34	72	a	3.8	a
8	BAS 595 XG (high rate) + Acquire + Stamina + Axcess	73	a	2.5	a
	LSD (P=0.10)	20		1.2	
[1] Treatments are ranked from the lowest percent stand to the highest.					
[2] Values are means of four replications.					
[3] Means followed by the same letter do not significantly differ (P=0.10 Student-Newman Keuls)					

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