

Efficacy of new SDHI seed treatments against Fusarium stalk rot in sweet corn, spring 2023.

This study was conducted at the Virginia Tech Eastern Shore Agriculture Research and Extension Center located in Painter, VA. Sweet corn was planted with a two-row cone planter into Bojac sandy loam soil on 26 Apr. Seeds were planted on 36 in. row spacing, 8 in. apart, and at a depth 1.5 in. Treatment plots were 36 ft long and 2 rows wide. Each plot contained 90 seeds and was separated by a 3 ft walkway within a row. Seed treatments were assigned to plots and plots were arranged in a randomized complete block design with four replicates. Plots were fertilized with 60 lb N/A prior to planting and side dressed with 50 lb N/A on 5 Jun; 200 lb/A of potash was broadcast on 1 Jun. Weeds were managed with a preemergent herbicide (Bicep II Magnum), cultivation, and glyphosate. Plots were irrigated with a boom irrigation reel as needed. On 15 Jun a plant stand rating was taken at the 5-6 leaf stage as the number emerged plants out of the total number of seeds planted. At this time weak plant ratings (the number of plants in each plot that are 2 or more leaves behind the average in that plot) were also taken. On 30 Jun, 10 plants per plot were arbitrarily selected and injected 2 in. above the brace roots with 1 ml of conidia suspension (1.6×10^7 conidia/ml) derived from *Fusarium graminearum*, *F. oxysporum*, *F. proliferatum*, and *F. verticillioides* using a disposable syringe. Ten plants in each non-inoculated control plot were injected with deionized water. All plants receiving an injection were marked with flagging tap. On 25 Jul the marked plants were split open and rated for stalk rot. Disease severity was estimated using a 1-9 categorical rating scale (see footnote in Table). Stalk rot incidence was determined from the number of plants with a rating of 2 or higher out of the total number of plants rated. Statistical analysis was conducted with SAS software (v9.3) and a generalized linear mixed model; blocks were considered random effects.

This was an early season trial with plant emergence beginning on 7 May. The plot incurred billbug (*Sphenophorus callosus*) damage (0-5.3% incidence on 24 May) but there was no significant difference in damage among treatment plots (*data not shown*). There were no differences in stand establishment amongst any of the seed treatments. SYN549522 was significantly similar to other seed treatments in the percentage of weak plants and did not cause a delay in the plant growth. No phytotoxicity was observed. Symptom development in inoculated plants was sporadic with moderate severity. There were no differences in stalk rot severity among inoculated plants. Stalk rot incidence overall was moderate and similar among all seed treatments.

Treatment and amount/seed ^z	Inoculated	Emergence		Stalk Rot	
		Stand (%)	Weak Plants (%)	Severity (1-9 Scale) ^x	Incidence (%)
Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg	no	75.3	7.3 a ^y	1 ... ^w	0 ...
Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg	yes	65.9	7.2 a	2.8	37.5
Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg Adepidyn 0.0533 mg	yes	72.5	5.4 a	2.7	42.5
Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg Adepidyn 0.0805 mg	yes	74.4	9.3 a	3.1	57.5
SYN549522 0.2 mg Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg	yes	77.2	6.9 a	2.8	37.5
SYN549522 0.3 mg Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg	yes	72.5	8.6 a	2.6	42.5
SYN549522 0.4 mg Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg	yes	71.4	7.0 a	2.8	37.5
Vibrance CINCO 0.0767 mg Cruiser 0.5 mg Fortenza 0.25 mg	yes	80.3	3.5 a	2.6	40
ANOVA <i>P</i> -value	...	0.1578	0.0543	0.9961	0.8380

^z Seed treatments applied as a slurry by Syngenta Crop Protection.

^y Column means with a letter in common are not significantly different (LSD t-test; P=0.05).

^x Categorical rating scale for disease severity: 1 = no visible internal stalk discoloration at inoculation site; 2 = <25% of toothpick-inoculated internode showing discoloration; 3 = 26 – 50% in toothpick-inoculated internode showing discoloration; 4 = 51% - 75% of toothpick-inoculated internode showing discoloration; 5 = 76 – 100% of inoculated node is discolored; 6 = 100% of inoculated internode is discolored; internode above with <50% discoloration; 7 = 100% of inoculated internode is discolored; internode above with >51% discolored; 8 = Inoculated internode and the internode above 100% discolored with spotty discoloration in 3rd internode; 9 = discoloration has spread beyond inoculated and 2nd node; stalk rind comprised.

^w “...” = No symptoms developed in inoculations with the water control and stalk rot ratings for this treatment were not included in the statistical analysis.