

Efficacy of new SDHI seed treatments against *Fusarium* stalk rot in sweet corn, summer 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 15 Jun. Seeds were planted on 36 in. row spacing, 8 in. apart, and at a depth 1.5 in. Treatment plots were 40 ft long and 2 rows wide. Each plot contained 126 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 and 200 lb potash/A prior to planting and side dressed with 50 lb N/A on 10 Jul. Weeds were managed with a preemergent herbicide (Bicep II Magnum), cultivation and glyphosate. On 7 Aug, plants 10 plants per plot were arbitrarily selected and injected 2 in. above the brace roots with 1 ml of conidia suspension (1.2×10^7 conidia/ml) derived from *Fusarium graminearum*, *F. oxysporum*, *F. proliferatum*, and *F. verticillioides* isolates using a disposable medical syringe. Ten plants in each non-inoculated control plot were injected with deionized water. All plants receiving an injection were marked with flagging tape. On 31 Aug 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.

Symptom development in inoculated plants was widespread with moderate stalk rot severity. All treatments had significantly less stalk rot incidence compared to the non-inoculated control. The overall stalk rot incidence was high (nearly double that of the spring trial) reaching at least 80% in the Adepidyn treatments. There were no significant differences in stalk rot incidence among seed treatments in pathogen-challenged plants. All treatments had significantly less stalk rot incidence and severity compared to the non-inoculated control. Stalk rot severity in SYN54922 and Adepidyn seed treatments were statistically similar to the grower standard seed treatment containing Vibrance CINCO. Stalk rot severity in SYN549522 treatments was significantly lower than in seed treatments with Apron XL (alone) and the higher rate of Adepidyn (0.0805 mg/seed). The lower rate of Adepidyn (0.0533 mg/seed) was statistically similar to both the higher rate of Adepidyn and the SYN54922 treatments. There were no differences in stalk rot severity among the three rates of SYN549522 or among the two rates of Adepidyn. No phytotoxicity was observed.

Treatment and amount/seed ^z	Inoculated	Stalk Rot	
		Severity (1-9 Scale) ^y	Incidence (%)
Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg	no	1.2 c ^x	20.0 b
Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg	yes	3.0 a	77.5 a
Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg Adepidyn 0.0533 mg	yes	2.5 ab	80.0 a
Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg Adepidyn 0.0805 mg	yes	3.0 a	82.5 a
SYN549522 0.2 mg Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg	yes	2.3 b	65.0 a
SYN549522 0.3 mg Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg	yes	2.4 b	75.0 a
SYN549522 0.4 mg Apron XL 0.022 mg Cruiser 0.5 mg Fortenza 0.25 mg	yes	2.2 b	72.5 a
Vibrance CINCO 0.0767 mg Cruiser 0.5 mg Fortenza 0.25 mg	yes	2.7 ab	75.0 a
ANOVA <i>P</i> -value	...	<0.0001	<0.0001

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

^y 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.

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