

VIRGINIA CORN BOARD REPORT– FY2022-23 On-farm trials for evaluating in-furrow products for controlling plant-parasitic nematodes and diseases of corn in Virginia.

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OBJECTIVES:

- 1) Conduct on-farm strip trials to determine the effect of nematicide and fungicide treatments on corn yield.
- 2) To determine the cost benefit of in-furrow nematicides and fungicides.

RESULTS:

Nematicide Trials:

Two corn in-furrow nematicide strip trials were initiated in Surry (2) and one replicated trial evaluating Xyway LFR was conducted at the Tidewater AREC in Suffolk, VA. Both trials were planted in early-April. At location 1 (Itata Farms), in-furrow treatments were no in-furrow nematicide and Velum at 3.0 and 6.0 fl oz/acre and strips were replicated 3 times. Location 2 was planted in a randomized complete block design with 6 replications per treatment. Treatments at location 2 were Counter at 6.0 Oz/1,000 row ft and Velum at 6.5 fl oz/acre and an untreated check. equipment. Soil nematode samples were collected at both locations jus after harvest. At location 1, corn was harvested using weigh scales while location 2 utilized a yield monitor using AgFiniti® software. Yield data per strip treatment at location 2 were calculated using AgStudio® by Tidewater Agronomic Services, LLC. Nematode populations were low across the trial at location 1 with only stunt nematode being present at threshold populations (Table 1). Overall, nematode populations were similar or extremely variable across treatments and none of the treatments demonstrated an advantage of reducing nematode populations. Velum at 3.0 fl oz/acre resulted in the highest yield and net return while the 6.0 fl oz/acre rate of Velum did not produce yield that resulted in a positive cost-benefit.

Table 1. Nematode populations, corn yield and cost benefit (Itata Farms, Surry, VA 2022).

In-furrow treatment and rate	Nematodes /500 cc soil ^y			Yield (bu/A)	Value @ \$6.50 bu ^z
	Stunt	Spiral	Lance		
Untreated	101	13.3	93.3	132.9	-
Velum, 3.0 fl oz/A	100	200	133.3	138.1	\$18.50
Velum, 6.0 oz/1000 row ft	126.7	66.7	133.3	133.5	-\$26.70

^y Data are the mean counts of nematodes in a sample from three replications of each treatment. ^z Value of each treatment was calculated by subtracting the value of the yield of the untreated check from the value of the yield of the nematicide treatment using a price of \$6.50/bushel and then subtracting the cost of the nematicide treatment (Velum cost is ca. \$30.60/acre).

Nematode populations were low and variable at location 2 with no significant differences detected between treatments (Table 2). There was only a 3.2 bushel difference between the lowest and highest yield among treatments which resulted in negative values for both Counter and Velum,

Table 2. Nematode populations, corn yield and cost benefit (Berryman Farms, Surry, VA 2022).

In-furrow treatment and rate	Nematodes /500 cc soil ^x			Yield (bu/A)	Value @ \$6.50 bu ^y
	Root-Knot	Lance	Ring		
Untreated	27	63	167	229	-
Velum, 6.0 fl oz/A	57	77	83	230	-\$24.10
Counter, 5.0 lbs/A	73	57	113	231	-\$15.75
<i>P</i> (F) ^z	0.41	0.90	0.18	0.55	

^x Data are the mean counts of nematodes in a sample from three replications of each treatment. ^y Value of each treatment was calculated by subtracting the value of the yield of the untreated check from the value of the yield of the nematicide treatment using a price of \$6.50/bushel and then subtracting the cost of the nematicide treatment (Counter = \$22.25/acre and Velum = \$30.60/acre). ^zData are the mean counts of nematodes in a sample from six reps of each treatment. Square root transformation of population data was made in analysis to determine statistical significance.

Xyway Trial:

At-plant applications of Xyway LFR was compared to foliar fungicides at the Tidewater AREC in 2022. Plots that were 2, 30-ft long rows spaced 36-inches were planted to corn on April 25th. The variety DKC 6895 was used as it was identified as having low resistance to gray leaf spot. Plots were replicated 4 times and were laid out in randomized complete blocks. Xyway LFR was applied at planting either in-furrow or in a 2"x2" band. Foliar fungicides were applied at 20 GPA at tasseling. Due to extremely dry conditions, gray leaf spot pressure was very low throughout the season. However, a potentially new disease of corn was present that responded to foliar fungicide treatments. Both Veltyma and Topguard EQ were the only fungicides that reduced the percent leaf area affected below untreated plots on August 25th. Despite differences in disease levels among fungicides, differences in yield and test weight were not detected. The new disease has been isolated and partially identified to the genus *Phomopsis* but currently poses little threat to yield in corn.

Table 3. Effect of fungicide treatment and application timing on foliar disease and yield in corn Tidewater AREC, Suffolk, VA 2022).

Treatment, rate/A and timing ^z	"Unknown" leaf spot		Yield (bu/A) ^w	Test weight (lb/bu)
	(0-10) ^y 8 Aug	% leaf area ^x 25 Aug		
Untreated control	6.5	40.0 a ^v	227.2	63.2
Xyway LFR 15.2 fl oz (IF)	6.3	28.8 ab	217.6	62.7
Xyway LFR 15.2 fl oz (2x2)	6.3	25.0 ab	198.5	62.3
Xyway LFR 10.5 fl oz (IF)				
Topguard EQ 5 fl oz (VT/R1)	5.0	22.5 a-c	224.1	62.6
Topguard EQ 5 fl oz (VT/R1)	5.8	10.5 bc	223.6	62.8
Veltyma 7 fl oz (VT/R1)	3.8	4.0 c	223.8	62.6
<i>P</i> (F)	0.052	0.02	0.30	0.51

^zSeed with in-furrow (IF) and 2"x2" (2x2) treatments were planted on 25 Apr. Foliar fungicides were applied at VT/R1 (tasseling/silking) on 5 Jul. ^yLeaf spot rating scale: 0 = none, 10 = 100 % percent incidence of unknown foliar disease.

^xPercent leaf area with symptoms of unknown foliar disease. All ratings observed on ear leaf and one leaf above ear leaf.

^wYields are weight of corn with moisture content of 15.5%. Corn was harvested on 21 Sep. One bushel = 56 lbs of grain.

^vMeans in a column followed by the same letter(s) are not significantly different according to Fisher's Protected LSD (*P*=0.05).