

Corn Response to Fungicide and Preharvest Desiccant, Carrington, 2009

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Trial objectives were to measure potential yield increase with foliar-applied 'plant health' fungicide and explore potential for quicker seed dry-down and harvest using a pre-harvest desiccant. The conventional-till, dryland field trial was established at the NDSU Carrington Research Extension Center on a Heimdal-Emrick loam soil with crambe as the previous crop. Experimental design was a randomized complete block with split plot arrangement [main plot = hybrids (2) and subplots = fungicide (2 trts) and desiccant (2 trts)] with four replications. Fall soil analysis indicated 139 lb nitrate-N/A, 5 ppm phosphorus, 146 ppm potassium, 2.0% organic matter, and 7.9 pH. Pioneer '39D97' [79-day relative maturity (RM)] and DeKalb '38-89' (88-day RM) were planted at 26,000 seeds/A in 8-row plots with 30 ft depth and 30-inch row spacing on May 19. 10-34-0 was applied at 5 gal/A in a 2x2-inch band during planting. Best management practices were used for corn production. Early-season zinc deficiency symptoms were expressed by plants, which were treated twice with foliar zinc during trial treatments with glyphosate. Headline at 6 fl oz/A + Preference (NIS) at 0.25% v/v was applied with a tractor-mounted CO₂ –pressurized sprayer with 015F110 flat-fan nozzles delivering 13 gal/A at 30 psi at the R1 (silk) stage on August 10 with 66° F and 86% RH to the 79-day RM hybrid and August 12 with 76° F and 62% RH to the 88-day RM hybrid. Gramoxone Inteon (paraquat) at 32 fl oz/A + Preference (NIS) at 0.25% v/v was applied at approximately the half-milk stage on September 29 with 49° F and 68% RH to the 79-day RM hybrid and on October 7 with 45° F and 84% RH to the 88-day RM hybrid. Seed was sampled from the early-maturing hybrid on September 28 and seed moisture estimated at 43%. Seed was sampled from the late-maturing hybrid on October 7 and seed moisture estimated at 47%. Two hours of 30-31° F occurred on September 29 and a minimum air temperature of 22° F occurred on October 8. Common corn leaf rust was visually evaluated on October 5 by examining five ear leaves/plot. The trial was harvested with a plot combine on November 23.

Test weight was greater and seed moisture less, while seed yield tended to be greater, with the early-maturing hybrid (Table 1). Leaf rust severity was very low, essentially providing no practical opportunity for influence by fungicide. Corn seed yield and quality were similar compared to the untreated check. Seed moisture tended to be less with preharvest desiccant, but generally did not impact see yield or quality. Factor interactions were statistically non-significant among disease, seed yield and seed quality (Table 2).

Table 1. Corn Response to Main Factors, Carrington, 2009.

Treatment	Corn					
	Common leaf rust	Seed yield	Test weight	Seed moisture	Seed protein	Seed starch
Name	% severity	bu/A	lb/bu	%		
<u>Hybrid:</u>						
Pioneer 39D97 (79 day RM)	1	130.8	50.8	18.9	10.4	67.5
DeKalb DKC38-89 (88 day RM)	1	128.1	47.8	24.3	10.4	68.0
LSD (0.05)	NS	NS	1.1	2.2	NS	NS
<u>Fungicide:</u>						
Headline	1	129.3	49.2	21.7	10.4	67.6
untreated check	2	129.6	49.5	21.5	10.4	67.8
LSD (0.05)	1	NS	NS	NS	NS	NS
<u>Desiccant:</u>						
paraquat	1	128.3	49.4	21.0	10.6	67.7
untreated check	1	130.7	49.2	22.2	10.3	67.8
LSD (0.05)	NS	NS	NS	NS	0.3	NS
mean	1	129.5	49.3	21.6	10.4	67.7
CV (%)	67.0	8.6	2.9	13.8	3.7	1.1

Table 2. Corn Response to Factor Interactions, Carrington, 2009.

Treatment		Corn					
		Common leaf rust	Seed yield	Test weight	Seed moisture	Seed protein	Seed starch
		% severity	bu/A	lb/bu	%		
<u>Hybrid:</u>	<u>Fungicide:</u>						
Pioneer 39D97 (79 day RM)	Headline	1	131.9	50.8	18.6	10.5	67.4
DeKalb DKC38-89 (88 day RM)	Headline	1	126.7	47.5	24.7	10.4	67.9
Pioneer 39D97 (79 day RM)	untreated check	2	129.8	50.8	19.3	10.4	67.6
DeKalb DKC38-89 (88 day RM)	untreated check	2	129.5	48.2	23.8	10.4	68.1
LSD (0.05)		NS					
	<u>Desiccant:</u>						
Pioneer 39D97 (79 day RM)	paraquat	1	129.2	51.1	18.3	10.7	67.3
DeKalb DKC38-89 (88 day RM)	paraquat	1	127.3	47.6	23.7	10.5	68.1
Pioneer 39D97 (79 day RM)	untreated check	2	132.5	50.5	19.6	10.2	67.7
DeKalb DKC38-89 (88 day RM)	untreated check	1	128.9	48.0	24.8	10.4	67.9
LSD (0.05)		NS					
<u>Fungicide:</u>	<u>Desiccant:</u>						
Headline	paraquat	1	128.7	49.4	20.7	10.6	67.5
untreated check	paraquat	2	127.8	49.3	21.3	10.6	67.9
Headline	untreated check	1	129.9	48.9	22.6	10.3	67.8
untreated check	untreated check	2	131.5	49.6	21.8	10.3	67.8
LSD (0.05)		NS					
mean		1	129.5	49.3	21.6	10.4	67.7
CV (%)		67.0	8.6	2.9	13.8	3.7	1.1