

EVALUATION OF YIELDGARD® CORN ROOTWORM TECHNOLOGY FOR CONTROL OF CORN ROOTWORM LARVAE, 2004.

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Two YieldGard® Rootworm Hybrids, Dekalb DKC60-05 (RR2/YGRW) and Dekalb DKC60-13 (RR2/YGRW), were compared to their isolines, Dekalb DKC59-08 and Dekalb DKC60-15, for efficacy against corn rootworm larvae. Plots were planted at the OARDC Western Agricultural Research Station near South Charleston, Ohio, at the OARDC Northwest Agricultural Research Station near Hoytville, OH and as on farm trials in Allen, Clark, Knox, Morrow, Miami and Wood Counties. Plots were planted as replicated trials at the Western and Northwest Stations and as strip trials at the on farm trials. A different group of hybrids were compared at the Allen County site. The Allen County site compared YieldGard® Rootworm Hybrids, Dekalb DKC60-05 (RR2/YGRW) and Dekalb DKC60-13 (RR2/YGRW), with their isolines, Dekalb DKC60-09 and Dekalb DKC60-17. All plots were established in fields that were in corn in 2003 except for the Allen County site which was in soybean in 2003. Rootworm feeding injury was evaluated at each location in July by randomly digging 5 roots per replicate for each treatment at the Stations and 10 roots per strip at the on-farm trials. Roots were washed, examined for corn rootworm larval feeding injury and rated in accordance with the 1-6 “Traditional” scale and the Node Injury Scale (0-3).

Table 1 contains background data for each of the station trials and the on-farm trials. Table 2 contains trials results from the Western and Northwest Stations. Table 3 contains the averages from the on-farm trials. Table 4 contains the results from the Dekalb DKC59-08 and Dekalb DKC60-05 (RR2/YGRW) comparison and table 5 contains the results from the Dekalb DKC60-15 and Dekalb DKC60-13 (RR2/YGRW) comparison.

Root ratings were very low at all sites except for the replicated trial at the Western Station. Significant differences in root ratings were observed in the replicated trials at the Western Station. Significant differences in yields were observed between Dekalb DKC60-13 (RR2/YGRW) and Dekalb DKC60-15 at both the Western and Northwest Stations.

YieldGard Rootworm hybrids out yielded their isolines by an average of 25.4 bushels under heavy rootworm pressure at the Western Station and YieldGard Rootworm hybrids out yielded their isolines by an average of 4.4 bushels under light rootworm pressure at the Northwest Station. YieldGard Rootworm hybrids out yielded their isolines by an average of 1.8 bushels per acre in the on-farm trials.

Table 1. Evaluation of YieldGard Rootworm Hybrids and Equivalent Isolines in Replicated Research Station Trials and Non-Replicated On-Farm Trials

Replicated Trials at OARDC Research Stations

Location:	Western Agricultural Research Station, South Charleston, Clark County
Prior Crop:	Sweet corn trap crop
Tillage:	Stale Seedbed
Plot Size:	4 row plots x 60' 4 reps
Planted:	27 April
Root Rating:	8 July 5 plants/plot
Stand Count:	21 September
Harvest:	12 October

Location:	Northwest Agricultural Research Station, Hoytville, Wood County
Prior Crop:	Corn
Tillage:	Stale seedbed
Plot Size:	4 Row Plots x 87 feet long. RCBD replicated 4X
Planted:	27 April
Root Rating:	9 July 5 plants/plot
Stand Count:	23 September
Harvest:	22 October

Non-Replicated On-Farm Trials

County	Prior Crop	Planted	Root Rating	Stand	Harvest	Cooperating Extension Agents
Allen	Soybean	26 April	21 July	11 Nov	11 Nov	Curtis Young
Clark	Corn	13 May	15 July	21 Sept	1 Nov	
Knox	Corn	7 May	12 July		26 Oct	John Barker
Morrow	Corn	6 May	12 July		18 Oct	Steve Ruhl
Miami	Corn	19 April	15 July	30 Sept	10 Oct	Harold Watters
Wood	Corn	22 April	16 July	23 Sept	22 Oct	

Table 2. Stand counts, corn rootworm injury and yields of YieldGard Rootworm trials at Western and Northwest Agricultural Research Stations, 2004.

Replicated Trials

Western Agricultural Research Station

Field Corn Hybrid	Properties	Plants/ 50 Row Feet	Root Rating 0-3 Node- Injury Scale	1-6 “Traditional” Scale	Yield BuAcre
Dekalb DKC60-05 (RR2/YGRW)	YieldGard Rootworm	64.25 a	0.10 a	1.97 a	191.1 a
Dekalb DKC59-08	Non-Bt	64.00 a	1.14 b	3.80 b	190.3 a
Dekalb DKC60-13 (RR2/YGRW)	YieldGard Rootworm	72.75 a	0.06 a	1.60 a	235.4 a
Dekalb DKC60-15	Non-Bt	60.50 a	1.74 b	4.33 b	185.5 b
Average Bt		68.50 a	0.08 a	1.79 a	213.3
Average non-Bt		62.25 a	1.43 b	4.07 b	187.9
Difference	YGRW vs Non-YGRW				25.5

Means in a column followed by the same letter are not significantly different (P=0.05).

- Significant differences in yield were observed between DKC60-13 and DKC60-15.

Northwest Agricultural Research Station

Field Corn Hybrid	Properties	Plants/ 50 Row Feet	Root Rating 0-3 Node- Injury Scale	1-6 “Traditional” Scale	Yield BuAcre
Dekalb DKC60-05 (RR2/YGRW)	YieldGard Rootworm	80.00 a	0.03 a	1.10 a	171.0 a
Dekalb DKC59-08	Non-Bt	81.50 a	0.04 a	1.40 a	173.3 a
Dekalb DKC60-13 (RR2/YGRW)	YieldGard Rootworm	80.00 a	0.03 a	0.80 a	187.3 a
Dekalb DKC60-15	Non-Bt	81.00 a	0.03 a	1.10 a	176.2 b
Average Bt		80.00	0.03	0.95	179.2
Average non-Bt		81.25	0.035	1.25	174.8
Difference	YGRW vs non-YGRW				4.4

Means in a column followed by the same letter are not significantly different (P=0.05).

- Significant differences in yield were observed between DKC60-13 and DKC60-15.

Table 3. – Average Root ratings and yields per YieldGard Rootworm corn hybrid and non-Bt rootworm corn isolines of six on-farm trials.

County Location	Hybrid Properties	Root Rating		Yield Bushels/A
		0-3 Node Injury Scale	1-6 “Traditional” Scale	
Allen	YieldGard Rootworm non-Bt	0.03	0.09	162.8
		0.08	2.00	162.1
Clark	YieldGard Rootworm non-Bt	0.02	0.60	148.3
		0.06	1.90	135.0
Knox	YieldGard Rootworm Non-Bt	0.010	0.30	138.1
		0.025	0.90	146.3
Miami	YieldGard Rootworm Non-Bt	0.04*	1.40*	145.0
		0.07*	2.00*	97.8**
Morrow	YieldGard Rootworm non-Bt	0.015	0.50	162.1
		0.04	1.50	168.4
Wood	YieldGard Rootworm Non-Bt	0.045	1.70	204.2
		0.08	2.15	194.8
5 Site Avg***	YieldGard Rootworm non-Bt			163.1
				161.3
Difference	YG vs non-Bt			1.8

* Root rating from only one pair of hybrids.

** Non YieldGard Hybrid may have been damaged by herbicide drift.

*** Yields were averaged over 5 sites because of large differences in the Miami site that might have been due to herbicide drift injury .

Table 4. – Root ratings and yields per Bt rootworm corn hybrid and non-Bt rootworm corn isolines of six on-farm trials.

County Location	Hybrid Properties	Root Rating		Yield Bushels/A
		0-3 Node Injury Scale	1-6 “Traditional” Scale	
Allen*	Dekalb DKC60-05 (RR2/YGRW)	0.03	1.00	159.3
	Dekalb DKC60-09 (RR2/YGCB)	0.09	2.20	161.7
Clark	Dekalb DKC60-05 (RR2/YGRW)	0.015	0.60	155.8
	Dekalb DKC59-08	0.074	2.00	138.2
Knox	Dekalb DKC60-05 (RR2/YGRW)	0.01	0.20	130.0
	Dekalb DKC59-08	0.03	1.20	143.6
Miami	Dekalb DKC60-05 (RR2/YGRW)	0.04	1.40	145.0
	Dekalb DKC59-08	0.07	2.00	97.8**
Morrow	Dekalb DKC60-05 (RR2/YGRW)	0.01	0.40	160.2
	Dekalb DKC59-08	0.04	1.40	172.6
Wood	Dekalb DKC60-05 (RR2/YGRW)	0.05	1.80	201.3
	Dekalb DKC59-08	0.07	2.00	188.3
5 Site Avg***		0.023	0.80	161.3
		0.06	1.76	160.9
Difference	YG vs non-Bt			0.4

* A different pair of hybrids were compared at the Allen County site.

** Dekalb DKC59-08 at the Miami site may have been damaged by herbicide drift.

*** Only five sites were averaged because of the large difference in yield at the Miami site.

Table 5 – Root ratings and yields per YieldGard Rootworm hybrids and non YieldGard rootworm corn isolines of five on-farm trials.

County Location	Hybrid Properties	Root Rating		Yield Bushels/A
		0-3 Node Injury Scale	1-6 “Traditional” Scale	
Allen*	Dekalb DKC60-13 (RR2/YGRW)	0.02	0.80	166.2
	Dekalb DKC60-17 (RR2)	0.06	1.80	162.4
Clark	Dekalb DKC60-13 (RR2/YGRW)	0.02	0.60	140.7
	Dekalb DKC60-15	0.05	1.80	131.7
Knox	Dekalb DKC60-13 (RR2/YGRW)	0.01	0.40	146.3
	Dekalb DKC60-15	0.02	0.60	149.0
Morrow	Dekalb DKC60-13 (RR2/YGRW)	0.02	0.60	164.0
	Dekalb DKC60-15	0.04	1.60	164.1
Wood	Dekalb DKC60-13 (RR2/YGRW)	0.04	1.60	207.8
	Dekalb DKC60-15	0.09	2.30	201.3
5 Site Avg		0.022	0.80	165.0
		0.052	1.62	161.7
Difference	YG vs non-Bt			3.3

* A different pair of hybrids were compared at the Allen County site.