

Roundup Ready® Corn II Systems Comparisons at Scottsbluff, Nebraska during the 2007 Growing Season.

Robert Wilson

A field study was initiated near Scottsbluff, Nebraska to compare various herbicide treatments for control of common lambsquarters in Roundup Ready Corn II. The experimental design was a randomized complete block with four replications. Plots were 11 feet wide by 35 feet long and were located on a sandy loam soil with an organic matter content of 1.3% and pH of 8.2. Corn, 'DKC 46-60', was planted on May 3. Herbicides were applied preemergence on May 8 and postemergence on May 24 and June 5 (Table 1). Herbicides were applied with a tractor-mounted sprayer calibrated to deliver 20 gallons of water per acre at 32-psi pressure with Spraying Systems 11002 VS nozzles. The environmental conditions at the time of spraying are given in Table 1.

Corn injury was evaluated on May 22 and 31 and on June 12 (Table 2). Crop injury from herbicides applied PRE was evident in plots treated with Harness, Harness Xtra, Balance Pro, and Resolve DF. There was significantly more corn injury from Harness and Harness Xtra than from Degree or Degree Xtra even though the active ingredient in Harness and Degree is the same (acetochlor plus MON 13900 safener). The only difference between the two herbicides is that Degree and Degree Xtra are present in an encapsulated formulation while Harness and Harness Xtra are not encapsulated. Corn stand was reduced 25% in plots treated with Harness or Harness Xtra when compared to the nontreated.

Weed density was moderate and major weeds consisted of common lambsquarters, puncturevine, hairy nightshade, redroot pigweed, and common purslane at average densities of 235, 2, 61, 17, and 2 plants per 92 sq ft, respectively. Roundup Original Max applied alone one or two times postemergence did not provide 90% or greater common lambsquarters control. Reduced puncturevine control was observed from PRE applications of Guardsman Max, Atrazine alone, or Resolve. The remaining weed control treatments all provided 97% or greater weed control.

Corn yield in the nontreated averaged 90 bu/acre while in the better

weed control treatments corn yield was over 220 bu/acre and demonstrates the competitive ability of the weed population on corn yield. The early season corn injury and stand reduction from Harness and Harness Xtra. When compared to Degree and Degree Xtra resulted in a 15.5 and 22.3%, reduction in corn grain yields, respectively. Preemergence application of Resolve followed postemergence by Atrazine plus Steadfast plus Callisto also caused a reduction in corn grain yield.

Table 1. Environmental Conditions at the Time of Herbicide Application.

Date	Air temperature (F)	Humidity (%)	Wind speed & direction (mph)	Time of day	Crop stage of growth	Weed heights					
						Colq	Puvi	Hans	Rrpw	Copu	
						----- (inches) -----					
May 8	58	47	5 NW	10:00 am	PRE			no weeds			
May 24	58	38	1 S	11:00 am	Post	1.5	—	1.5	1	—	
June 5	63	69	5 SE	9:00 am	Post 2	4	—	5	3	1	

Rainfall and irrigation before herbicide application.

Date	Amount	Date	Amount	Date	Amount
	- (inches) -		- (inches) -		- (inches) -
May 5	0.29	May 21	0.23	May 29	0.23
May 9	0.50	May 22	0.75	June 6	0.75

Table 2. Roundup Ready Corn II Systems Comparisons at Scottsbluff, NE during the 2007 Growing Season.

Treatment ¹	Rate	Corn growth stage	Corn				Percent weed control calculated from weed counts taken on 6/13 ³						
			Visual injury ²			Stand	Yield at 15.5% moisture	Colq	Puvi	Hans	Rrpw	Copu	Avg
			5/22	5/31	6/12								
	lb/acre		----- (%) -----			plants/acre	bu/acre	----- (%) -----					
Nontreated	—	—	0	0	0	32300	90.4	0	0	0	0	0	0
Harness Xtra	2.1	PRE											
Roundup Original Max + AMS	0.75	4" weeds	8	13	13	24300	176.8	99	99	99	99	99	99
Degree Xtra	2.0	PRE											
Roundup Original Max + AMS	0.75	4" weeds	0	0	0	32900	227.6	99	87	99	99	99	97
Guardsman Max	1.56	PRE											
Roundup Original Max + AMS	0.75	4" weeds	0	0	0	32900	220.8	99	62	99	99	99	92
Guardsman Max	1.87	PRE											
Roundup Original Max + AMS	0.75	4" weeds	0	0	1	32400	206.3	99	87	99	99	99	97
Harness	1.3	PRE											
Roundup Original Max + AMS	0.75	4" weeds	6	5	5	25200	188.4	99	99	99	99	99	99
Degree	1.4	PRE											
Roundup Original Max + AMS	0.75	4" weeds	0	0	1	32100	223.1	99	99	99	99	99	99
Outlook	0.56	PRE											
Roundup Original Max + AMS	0.75	4" weeds	0	2	3	32300	225.0	99	99	98	99	99	99
Outlook	0.75	PRE											
Roundup Original Max + AMS	0.75	4" weeds	0	0	1	32600	204.6	99	99	99	99	99	99
Lexar	1.86	PRE											
Touchdown Total + AMS	0.78	4" weeds	0	0	1	32000	220.2	99	99	99	99	99	99
Bicep II Magnum	2.0	PRE											
Touchdown Total + AMS	0.78	4" weeds	0	0	0	32400	230.6	99	99	99	99	99	99

Treatment ¹	Rate	Corn growth stage	Corn					Percent weed control calculated from weed counts taken on 6/13 ³						
			Visual injury ²			Stand	Yield at 15.5% moisture	10/23	Colq	Puvi	Hans	Rrpw	Copu	Avg
			5/22	5/31	6/12									
lb/acre			-----	(%)	-----	plants/acre	bu/acre	-----	(%)	-----				
Atrazine	1.5	PRE												
Roundup Original Max + AMS	0.75	4" weeds	0	3	2	32300	228.8	99	62	99	99	99	92	
Balance Pro	0.062	PRE												
Roundup Original Max + AMS	0.75	4" weeds	15	19	29	32000	220.2	99	99	99	99	99	98	
Resolve DF	0.0156	PRE												
Atrazine + Steadfast + Callisto + COC	1.0 + 0.035 + 0.0625	4" weeds	10	14	31	33500	174.8	99	74	99	99	99	94	
Lexar	2.78	PRE	4	1	0	32600	228.9	99	99	99	99	99	99	
Roundup Original Max + AMS	0.75	4" weeds	0	0	0	32500	230.3	85	99	98	99	74	91	
Roundup Original Max + AMS	0.75	2" weeds												
Roundup Original Max + AMS	0.75	4" weeds	0	0	0	32600	204.6	81	87	99	99	87	90	
LSD at 5%	—	—	4	5	5	2800	26.5	7	32	1	0	19	8	

¹ The following spray additives were combined with herbicide treatments: ammonium sulfate at 2% w/w and crop oil concentrate at 1% v/v.

² Corn visual injury was evaluated on a scale from 0 to 100 with 0 equal to no injury and 100 equal to death of the plant.

³ Percent weed control calculated from weed counts taken on June 13. Weed abbreviations are as follows: common lambsquarters (Colq), puncturevine (Puvi), hairy nightshade (Hans), redroot pigweed (Rrpw), and common purslane (Copu).