Pest Control in Crops Grown in Northwestern New Mexico, 2000

Annual Data Report 100-2000

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Cooperative Extension Service • College of Agricultural, Consumer and Environmental Sciences

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INTRODUCTION

Weeds cause more total crop losses than any other agricultural pest (Arnold, 1981–2008; Hall et al., 1995; Currie, 2004; Lorenzi and Jeffery, 1987). Weeds reduce crop yields and quality, harbor insects and plant diseases, and cause irrigation and harvesting problems (Chandler et al., 1984; Lorenzi and Jeffery, 1987; Currie, 2005; Massinga et al., 1999, 2003). As a result, weeds reduce the total value of agricultural products in the United States by 10 to 15% (Lorenzi and Jeffery, 1987). Estimated average losses during 1975 to 1979 in the potential production of field corn, potatoes, and onion ranged from 7 to 16% in the Mountain States Region, which includes New Mexico (Chandler et al., 1984). San Juan County ranks first in potato production, fourth in alfalfa production, and second in corn production among all New Mexico counties (New Mexico Agricultural Statistics, 2007).

An estimated 90% of all tillage operations are for weed control (J.G. Foster, personal communications, 2005–2007). Herbicides can reduce the number of required tillage operations and can be used where cultivation is not possible, such as within crop rows or in solid-seeded crops. With increasing fuel and labor costs, herbicides are often more economical than other methods of weed control.

Many herbicides are approved for use on crops grown on medium- and fine-textured, high-organic soils. Little information is available, however, regarding their effectiveness and safety on low-organic, coarse-textured soils that are common to northwestern New Mexico.

The Environmental Protection Agency (EPA) has become more stringent with regard to research data required for pesticide approval. Thus, it has become critical that state Agricultural Science Centers work closely with commercial companies developing new pesticides in order to obtain the research data required by the EPA. This cooperation will benefit the agricultural industry of the state and assist EPA pesticide registration.

Before 1980, the use of herbicides in northwestern New Mexico was limited. Most growers were still using 2,4-D in corn for broadleaf weed control, while annual grasses were left in check. In alfalfa, burning winter annual mustard and downy brome with propane was not uncommon. An herbicide field-screening program has provided essential information on the activity of new and old herbicides on crops grown in northwestern New Mexico (Arnold, 1981–2008).

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As new land on the Navajo Indian Irrigation Project comes under cultivation, weed and insect problems are varied and may change with each successive crop. It is only through continued research that the demand for reliable information on the use of pesticides in northwestern New Mexico can be met.

I wish to express my sincere appreciation to the following companies for providing technical assistance, products, and/or financial assistance: Bayer CropSciences, BASF, E.I. DuPont, Gowan, BLM/FFO, FMC, Monsanto, Dow AgroSciences, Navajo Agricultural Products Industry, Pioneer Hi-Bred, Syngenta Crop Protection, and Southwest Seed.

Broadleaf weed control in field corn with preemergence herbicides

Introduction

Weeds affect corn by competing for nitrogen and moisture. Season-long interference from weeds can reduce corn yields dramatically. Many preemergence herbicides are approved for use on field corn grown on medium- or fine-textured, high-organic soils. However, little information is available regarding the effectiveness and safety of herbicides for field corn grown under sprinkler irrigation on low organic matter, coarse-textured soils. These preemergence tests will indicate those herbicides that, when applied at normal use rates, are effective for season-long weed control in field corn without decreasing yields.

Objectives

- To determine efficacy of selected herbicides for control of annual broadleaf weeds in field corn.
- To determine corn yield and tolerance to applied selected herbicides.

Materials and methods

A field experiment was conducted in 2000 at Farmington, to evaluate the response of field corn (var. Pioneer 34K77) and annual broadleaf weeds to preemergence herbicides. Soils were fertilized according to New Mexico State University recommendations based on soil tests. The experimental design was a randomized complete block with three replications. Individual plots were 4 34-in. rows 30 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 30 psi. Field corn was planted with flexi-planters equipped with disk openers on May 8. Treatments were applied on May 9 and immediately incorporated with 0.75 in. of sprinkler-applied water. Black nightshade, common lambsquarters, and prostrate and redroot pigweed infestations were heavy and Russian thistle infestations were light throughout the experimental area. Visual evaluations of crop injury and weed control were made June 6 and July 6. Stand counts were made on June 6 by counting individual plants per 10 ft of the third row of each plot. Field corn was harvested on November 13 by combining the center two rows of each plot using a John Deere 3300 combine equipped with a load cell. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Weed control and injury evaluations: Weed control and crop injury evaluations are given in Tables 1 and 2. Stand counts are given in Table 1. Axiom plus Balance applied at 0.51 plus 0.03 lb/ac had the highest crop injury rating of 64%. Axiom plus Balance and NM 2001 applied at 0.28 plus 0.047 and 0.58, respectively, had the lowest stand count of 19. All treatments except the check gave excellent control of broadleaf weeds (Table 1). In Table 2, atrazine applied at 1.5 lb/ac gave poor control of redroot pigweed.

Crop yields: Yields are given in Table 2. Yields were 46 to 168 bu/ac higher in herbicide treated plots as compared to the check.

Broadleaf weed control in field corn with preemergence followed by sequential postemergence herbicides

Introduction

Many herbicides can be used in sequential treatments. Theses trials are preemergence herbicides followed by sequential postemergence treatments. If weeds escape the preemergence treatment, a postemergence treatment may then be used to assist in weed control.

Objectives

- To determine efficacy of selected herbicides for control of annual broadleaf weeds in field corn.
- To determine corn yield and tolerance to applied selected herbicides.

Materials and methods

A field experiment was conducted in 2000 at Farmington, to evaluate the response of field corn (Pioneer 34K77) and annual broadleaf weeds to preemergence followed by sequential postemergence herbicides. Soils were fertilized according to New Mexico State University recommendations based on soil tests. The experimental design was a randomized complete block with three replications. Individual plots were 4 34-in. rows 30 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 30 psi. Field corn was planted with flexi-planters equipped

Table 1. Control of Annual Broadleaf Weeds with Preemergence Herbicides in Field Corn on June 6; NMSU Agricultural Science Center at Farmington, NM, 2000

Treatments[a]	Rate (lb/ac)	Crop Injury[b] (%)	Stand Count (no.)	Weed Control[b,c] (%)				
				Cheal	Amare	Amabl	Solni	Saskr
Bicep Lite II Mag (pm)	2.25	1	25	100	100	100	100	100
Epic (pm)	0.193	4	24	100	100	100	99	100
Epic (pm) + atrazine	0.193 + 0.6	6	25	100	100	100	100	100
Epic (pm)	0.29	15	25	100	100	100	100	100
NM 2001	0.29	2	25	100	100	100	100	100
NM 2001	0.435	2	5	100	100	100	100	100
NM 2001 + atrazine	0.435 + 0.6	3	25	100	100	100	100	100
NM 2001	0.58	13	19	100	100	100	100	100
Axiom (pm) + Balance	0.51 + 0.03	64	24	100	100	100	100	100
Axiom (pm) + Balance	0.28 + 0.047	42	19	100	100	100	100	100
Axiom AT (pm) + Balance	1.125 + 0.03	21	24	100	100	100	100	100
Axiom AT (pm) + Balance	0.84 + 0.047	35	24	100	100	100	100	100
Axiom AT (pm) + Epic (pm)	0.56 + 0.11	7	26	100	100	100	100	100
Balance	0.047	11	25	100	100	100	100	100
Atrazine	1.5	0	26	100	100	100	100	100
Weedy check		0	26	0	0	0	0	0
LSD 0.05		16	3	1	1	1	1	1

[a]pm = packaged mix.

[b]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.

[c]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Saskr = Russian thistle.

Table 2. Control of Annual Broadleaf Weeds with Preemergence Herbicides in Field Corn on July 6; NMSU Agricultural Science Center at Farmington, NM, 2000

Treatments[a]	Rate (lb/ac)	Weed Control[b,c] (%)					Yield (bu/ac)
		Cheal	Amare	Amabl	Solni	Saskr	
Bicep Lite II Mag (pm)	2.25	100	99	100	98	100	228
Epic (pm)	0.193	100	100	97	100	100	273
Epic (pm) + atrazine	0.193 + 0.6	100	97	100	98	100	252
Epic (pm)	0.29	100	100	100	100	100	225
NM 2001	0.29	100	100	100	100	100	259
NM 2001	0.435	100	100	100	100	100	247
NM 2001 + atrazine	0.435 + 0.6	100	100	100	100	100	249
NM 2001	0.58	100	100	100	100	100	223
Axiom (pm) + Balance	0.51 + 0.03	100	100	100	99	100	151
Axiom (pm) + Balance	0.28 + 0.047	100	100	100	100	100	207
Axiom AT (pm) + Balance	1.125 + 0.03	100	100	100	100	100	226
Axiom AT (pm) + Balance	0.84 + 0.047	100	96	100	100	100	194
Axiom AT (pm) + Epic (pm)	0.56 + 0.11	100	98	100	100	100	237
Balance	0.047	100	96	100	100	100	263
Atrazine	1.5	100	66	93	97	100	236
Weedy check		0	0	0	0	0	105
LSD 0.05		1	2	2	1	1	36

[a]pm = packaged mix.

[b]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.

[c]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Saskr = Russian thistle.

Table 3. Control of Annual Broadleaf Weeds with Preemergence Herbicides Followed by Sequential Postemergence Herbicides in Field Corn on June 6; NMSU Agricultural Science Center at Farmington, NM, 2000

		Crop	Stand	Weed Control[b,c]				
	Rate	Injury[b]	Count	Amare	Amabl	Solni	Cheal	Saskr
Treatments[a]	(lb/ac)	(%)	(no.)	(%)				
Daul II Mag	0.95	0	25	100	100	92	93	57
Bicep Lite II Mag (pm)	1.65	0	27	100	100	98	100	100
Dual II Mag/Northstar[d,f] (pm)	0.95/0.15	0	27	100	100	100	92	43
Dual II Mag/Spirit[e,f] (pm)	0.95/0.035	0	26	100	100	92	86	47
Bicep Lite II Mag (pm)/Northstar[d,f] (pm)	1.65/0.15	0	25	100	100	99	100	100
Bicep Lite II Mag (pm)/Dual II Mag + Clarity + AAtrex[e]	1.65/0.3 + 0.37 + 1.35	0	25	100	100	99	100	100
Bicep Lite II Mag (pm)/Spirit[e,f] (pm)	1.65/0.035	0	25	100	100	100	100	100
Frontier/Clarity[d,f]	0.94/0.25	3	25	100	100	93	100	53
Frontier/Marksman[d,f] (pm)	0.94/1.2	3	25	100	100	97	100	57
Frontier/Distinct[d,f] (pm)	0.94/0.26	3	26	100	100	97	95	57
Topnotch/Hornet[d,f] (pm)	1.6/0.13	0	26	100	100	100	100	70
Harness Xtra (pm)/Permit[e,f]	2.7/0.032	0	25	100	100	100	100	100
Leadoff (pm)/Accent + Matrix + Hornet[e,f] (pm)	1.25/0.011 + 0.011 + 0.13	1	26	100	100	100	100	100
Leadoff (pm)/Basis Gold[e,f] (pm)	1.25/0.78	1	24	100	100	100	100	100
Degree/Permit[e,f]	1.19/0.032	0	25	100	100	98	100	43
Weedy check		0	25	0	0	0	0	0
LSD 0.05		1	ns	1	1	5	4	13

[a]Treatments listed first were applied preemergence and were evaluated on June 6, and pm = packaged mix.

[b]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.

[c]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

[d]A NIS was added at 0.25% v/v.

[e]A COC was added at 1 qt/ac.

[f]AMS was added at 2.5 lb/ac.

with disk openers on May 8. The preemergence treatments were applied on May 10, and immediately incorporated with 0.75 in. of sprinkler-applied water. Preemergence treatments were evaluated on June 6 before postemergence treatments were applied, with Dual II Mag and Bicep Lite II Mag being evaluated again on July 6. Sequential postemergence treatments were applied on June 7 when field corn was in the 4th leaf stage and weeds were small, and were evaluated on July 6. Black nightshade and redroot and prostrate pigweed infestations were heavy and Russian thistle and common lambsquarters infestations were light throughout the experimental area. Visual evaluations of crop injury and weed control were made June 6 and July 6. Stand counts were made on June 6 by counting individual plants per 10 ft of the third row of each plot. Field corn was harvested on November 14 by combining the center two rows of each plot using a John Deere 3300 combine equipped with a load cell. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Weed control and injury evaluations: Weed control and crop injury evaluations are given in Tables 3 and 4. Stand counts are given in Table 3. In Table 3, all treatments except the check gave good to excellent control of redroot and prostrate pigweed, black nightshade, and common lambsquarters. Bicep Lite II Mag, Harness Xtra, and Leadoff all gave excellent control of Russian thistle. Frontier caused the highest crop injury of 3%. In Table 4, when the sequential postemergence treatments were applied to those preemergence treatments not containing atrazine, Russian thistle control increased. The sequential postemergence combination treatment of Dual II Mag plus dicamba plus atrazine applied at 0.3 plus 0.37 plus 1.35 lb/ac caused the highest crop injury of 8% (data not shown). These data show that if atrazine is added to a preemergence herbicide, usually a postemergence herbicide, treatment for broadleaf weed control in this area is not needed.

Crop yields: Yields are given in Table 4. Yields were 108 to 156 bu/ac higher in herbicide treated plots as compared to the check.

Table 4. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence Herbicides in Field Corn on July 6; NMSU Agricultural Science Center at Farmington, NM, 2000

		Weed Control[b,c]					
Treatments[a]	Rate (lb/ac)	Amare	Amabl	Solni	Cheal	Saskr	Yield (bu/ac)
		(%)					
Dual II Mag	0.95	96	100	82	83	70	235
Bicep Lite II Mag (pm)	1.65	100	100	95	100	99	255
Dual II Mag/Northstar[d,f] (pm)	0.95/0.15	100	100	100	100	100	240
Dual II Mag/Spirit[e,f] (pm)	0.95/0.035	100	100	99	100	93	209
Bicep Lite II Mag (pm)/Northstar[d,f] (pm)	1.65/0.15	100	98	97	100	100	246
Bicep Lite II Mag (pm)/Dual II Mag + Clarity + AAtrex[e]	1.65/0.3 + 0.37 + 1.35	100	100	99	100	100	241
Bicep Lite II Mag (pm)/Spirit[e,f] (pm)	1.65/0.035	99	100	98	100	100	224
Frontier/Clarity[d,f]	0.94/0.25	100	96	92	100	100	235
Frontier/Marksman[d,f] (pm)	0.94/1.2	98	100	96	100	100	231
Frontier/Distinct[d,f] (pm)	0.94/0.26	100	100	91	100	100	236
Topnotch/Hornet[e,f] (pm)	1.6/0.13	100	100	99	100	100	247
Harness Xtra (pm)/Permit[e,f]	2.7/0.032	100	100	97	100	100	251
Leadoff (pm)/Accent + Matrix + Hornet[e,f] (pm)	1.25 + 0.011 + 0.011 + 0.13	100	100	97	100	100	253
Leadoff (pm)/Basis Gold[e,f] (pm)	1.25/0.78	100	100	100	100	100	257
Degree/Permit[e,f]	1.19/0.032	100	100	98	100	94	241
Weedy check		0	0	0	0	0	101
LSD 0.05		2	1	3	8	4	37

[a]Dual II Mag and Bicep Lite II Mag were evaluated along with the sequential postemergence treatments on July 6, and pm = packaged mix.

[b]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.

[c]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

[d]A NIS was added at 0.25% v/v.

[e]A COC was added at 1 qt/ac.

[f]AMS was added at 2.5 lb/ac.

Broadleaf weed control in field corn with preemergence followed by sequential postemergence herbicides

Materials and methods

A field experiment was conducted in 2000 at Farmington, to evaluate the response of field corn (var. Pioneer 34K77) and annual broadleaf weeds to preemergence followed by sequential postemergence herbicides. Soils were fertilized according to New Mexico State University recommendations based on soil tests. The experimental design was a randomized complete block with three replications. Individual plots were 4 34-in. rows 30 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 30 psi. Field corn was planted with flexi-planters equipped with disk openers on May 8. Preemergence treatments were applied on May 10 and immediately incorporated with 0.75 in. of sprinkler-applied water. Preemergence treatments were evaluated on June 6 before postemergence treatments were applied. Sequential postemergence treatments were applied on June 7 when field corn was in the 4th leaf stage and weeds were small, and were evaluated on July 6. Black nightshade, and redroot and prostrate pigweed infestations were heavy and Russian thistle and common lambsquarters infestations were light throughout the experimental area.

Visual evaluations of crop injury were made on June 6 and July 6. Stand counts were made on June 6 by counting individual plants per 10 ft of the third row of each plot. Field corn was harvested on November 14 by combining the center two rows of each plot using a John Deere 3300 combine equipped with a load cell. Results obtained were subjected to analysis of variance at P = 0.05.

Table 5. Control of Annual Broadleaf Weeds with Preemergence Herbicides Followed by Sequential Postemergence Herbicides in Field Corn on June 6; NMSU Agricultural Science Center at Farmington, NM, 2000

		Crop	Stand	Weed Control[b,c]				
	Rate	Injury[b]	Count	Amare	Amabl	Solni	Cheal	Saskr
Treatments[a]	(lb/ac)	(%)	(no.)	(%)				
ZA 5676	1.96	0	25	100	100	100	100	100
ZA 5676	2.18	0	24	100	100	100	100	100
ZA 1296	0.16	0	25	100	100	100	100	100
Outlook + ZA 1296	0.6 + 0.16	3	25	100	100	93	100	100
Guardsman (pm) + ZA 1296	2.2 + 0.16	4	24	100	100	100	100	100
Topnotch + ZA 1296	1.35 + 0.16	0	24	100	100	100	100	100
FulTime (pm) + ZA 1296	2.25 + 0.16	0	24	100	100	100	100	100
Outlook/Distinct (pm) + AAtrex[d]	0.6/0.18 + 0.5	2	24	100	100	83	93	33
Guardsman (pm)/Distinct[d]	2.2/0.18	0	24	100	100	100	100	99
Outlook/ZA 1296[e]	0.6/0.094	2	24	100	100	47	100	57
Guardsman (pm)/ZA 1296[e]	2.2/0.094	0	24	100	100	100	100	100
Topnotch/ZA 1296[e]	1.35/0.094	0	24	100	100	100	100	85
FulTime (pm)/ZA 1296[e]	2.25/0.094	0	24	100	100	100	100	100
Atrazine	1.5	0	25	100	100	100	100	100
Weedy check		0	25	0	0	0	0	0
LSD 0.05		1	ns	1	1	4	2	6

[a]Treatments listed first were applied preemergence and were evaluated on June 6, and pm = packaged mix.

[b]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.

[c]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

[d]A NIS and 32-0-0 were added at 0.25% v/v and 1 qt/ac, respectively.

[e]A COC was added at 1 qt/ac.

Table 6. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence Herbicides in Field Corn on July 6; NMSU Agricultural Science Center at Farmington, NM, 2000

		Weed Control[b,c]					
	Rate	Amare	Amabl	Solni	Cheal	Saskr	Yield
Treatments[a]	(lb/ac)	(%)					(bu/ac)
ZA 5676	1.96	100	100	82	100	68	247
ZA 5676	2.18	100	100	100	100	100	235
ZA 1296	0.16	100	100	100	100	100	204
Outlook + ZA 1296	0.6	100	100	95	100	100	245
Guardsman (pm) + ZA 1296	2.2 + 0.16	100	100	100	100	100	225
Topnotch + ZA 1296	1.35 + 0.16	100	100	100	100	100	249
FulTime (pm) + ZA 1296	2.25 + 0.16	100	100	100	100	100	225
Oulook/Distinct (pm) + AAtrex[d]	0.6/0.18 + 0.5	100	100	100	100	100	239
Guradsman (pm)/Distinct[d]	2.2/0.18	100	100	100	100	100	243
Outlook/ZA 1296[e]	0.6/0.094	100	100	100	100	82	254
Guradsman (pm)/ZA 1296[e]	2.2/0/094	100	100	100	100	100	238
Topnotch/ZA 1296[e]	1.35/0.094	100	100	100	100	92	255
FulTime (pm)/ZA 1296	2.25/0.094[e]	100	100	100	100	100	250
ZA 1296[e]	0.094	100	100	96	100	89	243
Atrazine	1.5	100	100	97	100	98	250
Weedy check		0	0	0	0	0	138
LSD 0.05		1	1	4	1	3	54

[a]Treatments listed first were applied preemergence and were evaluated on June 6, postemergence treatments were evaluated on July 6, and pm = packaged mix.

[b]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.

[c]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

[d]A NIS and 32-0-0 were added at 0.25% v/v and 1 qt/ac, respectively.

[e]A COC was added at 1 qt/ac.

Table 7. Control of Annual Broadleaf Weeds with Preemergence Applications of Dual II Mag and Frontier Alone or in Combination with Atrazine Followed by a Sequential Postemergence Application of Basis Gold, June 6; NMSU Agricultural Science Center at Farmington, NM, 2000

Treatments[a]	Rate (lb/ac)	Crop Injury[b] (%)	Stand Count (no.)	Weed Control[b,c] (%)				
				Cheal	Amare	Amabl	Solni	Saskr
Bicep Lite II Mag (pm)/ Basis Gold	2.25/0.79	0	16	100	100	100	100	100
Guardsman (pm)/Basis Gold	1.9/0.79	0	15	100	100	100	100	100
Dual II Mag/Basis Gold	0.95/0.79	0	16	60	100	100	100	40
Frontier/Basis Gold	0.94/0.79	0	16	70	100	100	100	50
Weedy check		0	15	0	0	0	0	0

[a]First treatment applied preemergence and rated on June 6, and pm = packaged mix.

[b]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.

[c]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Saskr = Russian thistle.

Results and discussion

Weed control and injury evaluations: Weed control and crop injury evaluations are given in Tables 5 and 6. Stand counts are given in Table 5. In Table 5, Guardsman plus ZA 1296 applied preemergence at 2.2 plus 0.16 lb/ac caused the highest injury rating of 4%. Redroot and prostrate pigweed and common lambsquarters control were good to excellent with all treatments except the check. Outlook applied at 0.6 lb/ac gave poor control of black nightshade and Russian thistle. In Table 6, redroot and prostrate pigweed and common lambsquarters control were excellent with all treatments except the check. ZA 5676 gave fair control of black nightshade and poor control of Russian thistle.

Crop yields: Yields are given in Table 6. Yields were 66 to 177 bu/ac higher in the herbicide treated plots as compared to the check.

A demonstration trial involving the control of broadleaf weeds with Dual II Mag or Frontier applied preemergence alone or in combination with atrazine followed by a sequential postemergence treatment of Basis Gold

Materials and methods

A field demonstration trial was conducted in 2000 at Farmington, to evaluate the response of field corn (var. white June corn) and annual broadleaf weeds to Dual II Mag or Frontier applied preemergence alone or in combination with atrazine followed by a sequential postemergence treatment of Basis Gold. Soils were fertilized according to New Mexico State University recommendations based on soil tests. Individual plots were 4 34-in. rows 360 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 30 psi. Field corn was planted with flexi-planters equipped with disk openers on May 8. Preemergence treatments were applied on May 10 and immediately incorporated with 0.75 in. of sprinkler-applied water. Basis Gold was applied on June 6 with a COC and 32-0-0 at 1% v/v. Black nightshade and prostrate and redroot pigweed infestations were heavy and common lambsquarters and Russian thistle infestations were light throughout the experimental area. Preemergence treatments were evaluated on June 6 and sequential postemergence were evaluated on July 6. Field corn was harvested on December 5 by combining the center two rows and obtaining an average.

Results and discussion

Weed control and injury evaluations: Crop injury and weed control evaluations are given in Tables 7 and 8. Stand count is given in Table 7. In Table 7, Dual II Mag and Frontier applied at 0.95 and 0.94 lb/ac gave poor control of common lambsquarters and Russian thistle. Redroot and prostrate pigweed and black nightshade control were good with all treatments. In Table 8, broadleaf weed control was excellent with the application of Basis Gold at 0.79 lb/ac.

Crop yields: Yields are given in Table 8. Yields averaged approximately 101 bu/ac across all treatments except for the check.

Table 8. Control of Annual Broadleaf Weeds with Preemergence Applications of Dual II Mag and Frontier Alone or in Combination with Atrazine Followed by a Sequential Postemergence Application of Basis Gold, July 6; NMSU Agricultural Science Center at Farmington, NM, 2000

		Weed Control[b,c]					
Treatments[a]	Rate (lb/ac)	Cheal	Amare	Amabl	Solni	Saskr	Yield (bu/ac)
		(%)					
Bicep Lite II Mag/Basis Gold[d]	2.25/0.79	100	100	100	100	100	104
Guardsman/Basis Gold[d]	1.9/0.79	100	100	100	100	100	99
Dual II Mag/Basis Gold[d]	0.95/0.79	100	100	100	100	100	101
Frontier/Basis Gold[d]	0.94/0.79	100	100	100	100	100	102
Weedy check		0	0	0	0	0	40

[a]Second treatment applied postemergence and rated on July 6, and pm = packaged mix.

[b]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.

[c]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Saskr = Russian thistle.

[d]Postemergence treatment applied with a COC and 32-0-0 at 1% v/v.

Broadleaf weed control in field corn with postemergence herbicides

Introduction

Postemergence herbicides are most effective if applied when the weeds and field corn are small. If weeds are not controlled, weeds will become difficult to control and corn growth will be restricted. This trial examined the efficacy of postemergence herbicides applied when field corn and weeds were small, and evaluated their effect on crop injury and field corn yields.

Objectives

- To determine efficacy of selected herbicides for control of annual broadleaf weeds in field corn.
- To determine corn yield and tolerance to applied selected herbicides.

Materials and methods

A field experiment was conducted in 2000 at Farmington, to evaluate the response of field corn (var. Pioneer 34K77) and annual broadleaf weeds to postemergence herbicides. Soils were fertilized according to New Mexico State University recommendations based on soil tests. The experimental design was a randomized complete block with three replications. Individual plots were 4 34-in. rows 30 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 30 psi. Field corn was planted with flexi-planters equipped with disk openers on May 8. The preemergence treatment was applied on May 9 and immediately incorporated with 0.75 in. of sprinkler-applied water. Postemergence treatments were applied on June 6 when field corn was in the 4th leaf stage and weeds were small. Black nightshade and redroot and prostrate pigweed infestations were heavy, common lambsquarters infestations were moderate, and Russian thistle infestations were light throughout the experimental area. Visual evaluations of crop injury and weed control were made July 6 and August 2. Stand counts were made on July 1 by counting individual plants per 10 ft of the third row of each plot. The preemergence treatment was evaluated on June 6 and July 6. Field corn was harvested on November 13 by combining the center two rows of each plot using a John Deere 3300 combine equipped with a load cell. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Weed control and injury evaluations: Weed control and crop injury evaluations are given in Tables 9 and 10. Stand counts are given in Table 9. In Table 9, DPX 79406 plus Clarity applied at 0.023 plus 0.25 lb/ac had the highest crop injury of 5%. All treatments gave good to excellent control of redroot pigweed except atrazine applied preemergence at 1.5 lb/ac and the check. Prostrate pigweed and common lambsquarters control were good to excellent with all treatments except the check. Black nightshade control was good to excellent with all treatments except DPX 79406 plus Tough applied at 0.023 plus 0.35 lb/ac and the check. DPX 79406 plus atrazine applied at 0.023 plus 0.45 lb/ac gave poor control of Russian thistle. In Table 10, atrazine applied preemergence at 1.5 lb/ac gave poor control of Russian thistle. Prostrate pigweed control was good to excellent with all treatments except the check. DPX 79406 plus Tough applied at 0.023 plus 0.35 lb/ac gave poor control of black nightshade, Russian thistle, and common lambsquarters.

Crop yields: Yields are given in Table 10. Yields were 151 to 175 bu/ac higher in herbicide treated plots as compared to the check.

Table 9. Control of annual Broadleaf Weeds with Postemergence Herbicides in Field Corn on July 6; NMSU Agricultural Science Center at Farmington, NM, 2000

		Crop	Stand	Weed Control[b,c]				
	Rate	Injury[b]	Count	Amare	Amabl	Solni	Saskr	Cheal
Treatments[a]	(lb/ac)	(%)	(no.)	(%)				
DPX 79406	0.023	0	24	100	100	100	82	100
DPX 79406 + atrazine	0.023 + 0.45	0	24	100	100	100	46	100
DPX 79406 + Clarity	0.023 + 0.125	3	24	100	100	100	100	100
DPX 79406 + Clarity	0.023 + 0.25	5	25	100	100	100	100	100
DPX 79406 + Marksman (pm)	0.023 + 0.4	0	25	100	100	100	100	100
DPX 79406 + Marksman (pm)	0.023 + 0.8	2	25	100	100	100	100	100
DPX 79406 + Distinct (pm)	0.023 + 0.1	0	24	100	100	100	100	100
DPX 79406 + Distinct (pm)	0.023 + 0.2	0	24	100	100	100	100	100
DPX 79406 + Distinct[d] (pm)	0.023 + 0.2	3	24	100	100	100	100	100
DPX 79406 + Tough	0.023 + 0.35	0	24	91	91	83	72	93
DPX 79406 + Tough	0.023 + 0.47	3	24	100	100	92	83	100
DPX 79406 + Hornet	0.023 + 0.086	2	25	100	100	100	70	100
DPX 79406 + Aim	0.023 + 0.008	0	24	100	100	83	87	100
DPX 79406 + 2,4-D	0.023 + 0.25	2	25	100	100	100	100	100
Atrazine[e]	1.5	0	24	83	97	97	100	100
Weedy check		0	24	0	0	0	0	0
LSD 0.05		1	ns	2	1	3	8	1

[a]pm = packaged mix.

[b]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.

[c]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Saskr = Russian thistle, and Cheal = common lambsquarters.

[d]Treatment was applied with NIS and 32-0-0 at 0.25 and 1% v/v, respectively. All other treatments had MSO and 32-0-0 applied at 1% v/v.

[e]Treatment was applied preemergence and rated on June 6.

Table 10. Control of annual Broadleaf weeds with Postemergence Herbicides in Field Corn on August 2; NMSU Agricultural Science Center at Farmington, NM, 2000

		Weed Control[b,c]					
	Rate	Amare	Amabl	Solni	Saskr	Cheal	Yield
Treatments[a]	(lb/ac)	(%)					(bu/ac)
DPX 79406	0.023	97	100	97	77	100	238
DPX 79406 + atrazine	0.023 + 0.45	92	100	95	82	100	259
DPX 79406 + Clarity	0.023 + 0.125	90	97	84	100	100	244
DPX 79406 + Clarity	0.023 + 0.25	97	100	99	100	100	243
DPX 79406 + Marksman (pm)	0.023 + 0.4	98	100	98	100	100	242
DPX 79406 + Marksman (pm)	0.023 + 0.8	97	100	99	100	100	237
DPX 79406 + Distinct (pm)	0.023 + 0.1	97	100	99	100	100	252
DPX 79406 + Distinct (pm)	0.023 + 0.2	97	100	92	100	100	246
DPX 79406 + Distinct[d] (pm)	0.023 + 0.2	96	100	96	100	100	235
DPX 79406 + Tough	0.023 + 0.35	97	100	65	62	83	259
DPX 79406 + Tough	0.023 + 0.47	96	100	98	96	96	242
DPX 79406 + Hornet	0.023 + 0.086	97	100	94	72	100	245
DPX 79406 + Aim	0.023 + 0.008	92	100	82	100	100	241
DPX 79406 + 2,4-D	0.023 + 0.25	96	100	99	100	100	269
Atrazine[e]	1.5	62	92	86	96	98	248
Weedy check		0	0	0	0	0	84
LSD 0.05		3	1	7	4	3	42

[a]pm = packaged mix.

[b]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.

[c]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Saskr = Russian thistle, and Cheal = common lambsquarters.

[d]Treatment was applied with NIS and 32-0-0 at 0.25 and 1% v/v, respectively. All other treatments had MSO and 32-0-0 applied at 1% v/v.

[e]Treatment was applied preemergence and evaluated on July 6.

Table 11. Control of Annual Broadleaf Weeds in Roundup Ready Field Corn with Preemergence Followed by Postemergence Herbicides on June 7; NMSU Agricultural Science Center at Farmington, NM, 2000

		Crop	Stand	Weed Control[b,c]				
	Rate	Injury[b]	Count	Cheal	Amare	Amabl	Solni	Saskr
Treatments[a]	(lb/ac)	(%)	(no.)	(%)				
Harness/Roundup	3.5/1.0	3	31	100	100	100	100	99
Degree/Roundup	3.5/1.0	1	33	100	100	100	100	66
Dual II Mag/Roundup	2.6/1.0	0	34	100	100	100	100	50
Topnotch/Roundup	3.5/1.0	8	33	100	100	100	100	100
Frontier/Roundup	2.2/1.0	8	30	100	100	100	100	66
Harness/Roundup	7.0/1.0	47	17	100	100	100	100	99
Degree/Roundup	7.0/1.0	10	33	100	100	100	100	92
Dual II Mag/Roundup	5.2/1.0	7	33	100	100	100	100	50
Topnotch/Roundup	7.0/1.0	6	33	100	100	100	100	98
Frontier/Roundup	4.4/1.0	67	16	100	100	100	100	88
Degree/Roundup	1.75/1.0	0	33	100	100	100	100	56
Dual II Mag/Roundup	1.3/1.0	0	32	100	100	100	100	50
Frontier/Roundup	1.1/1.0	0	33	100	100	100	100	66
Roundup/Roundup[d]	1.0/1.0	0	32	100	100	100	100	94
Atrazine	1.5	0	34	100	98	98	100	100
Weedy check		0	32	0	0	0	0	0
LSD 0.05		11	5	1	2	2	1	11

[a]First treatment applied preemergence and rated on June 7.

[b]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.

[c]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Saskr = Russian thistle.

[d]Treatments applied postemergence with AMS on June 6 and June 27 and rated on July 13.

Broadleaf weed control in Roundup Ready field corn with preemergence followed by postemergence herbicides

Introduction

Field corn is now being genetically altered so Roundup, Liberty, and Touchdown type herbicides may be applied postemergence without causing death to the field corn plant. These herbicides have no soil residual characteristics and sometimes may need the application of a preemergence herbicide to be applied early for effective weed control.

Objectives

- To determine efficacy of selected herbicides for control of annual broadleaf weeds in Roundup Ready field corn.
- To determine corn yield and tolerance to applied selected herbicides.

Materials and methods

A field experiment was conducted in 2000 at Farmington, to evaluate the response of Roundup Ready field corn (var. Dekalb 580RR) and annual broadleaf weeds to herbicides. Soils were fertilized according to New Mexico State University recommendations based on soil tests. The experimental design was a randomized complete block with three replications. Individual plots were 4 32-in. rows 30 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 30 psi. Field corn was planted with flexi-planters equipped with disk openers on May 8. Preemergence treatments were applied May 9 and immediately incorporated with 0.75 in. of sprinkler-applied water. The early postemergence treatment of Roundup was applied on June 6 when corn was in the 4th leaf stage and weeds were small. Postemergence treatments were applied on June 27 when corn was in the 8th leaf stage leaf and weeds averaged 4 to 6 in. in height. Common lambsquarters, redroot and prostrate pigweed, and black nightshade infestations were heavy and Russian thistle infestations were light throughout the experimental area. Preemergence treatments were evaluated for crop injury and weed control on June 7. The postemergence treatments were evaluated on July 13. Stand counts were made on June 7 by counting individual plants per 10 ft of the third row of each plot. Field corn was harvested on November 13 by combining the center

Table 12. Control of Annual Broadleaf Weeds in Roundup Ready Field Corn with Preemergence Followed by Postemergence Herbicides on July 13; NMSU Agricultural Science Center at Farmington, NM, 2000

		Weed Control[b,c]					
Treatments[a]	Rate (lb/ac)	Cheal	Amare	Amabl	Solni	Saskr	Yield (bu/ac)
		(%)					
Harness/Roundup	3.5/1.0	100	100	100	100	99	203
Degree/Roundup	3.5/1.0	100	100	100	100	100	227
Dual II Mag/Roundup	2.6/1.0	100	100	100	100	100	213
Topnotch/Roundup	3.5/1.0	100	100	100	100	100	212
Frontier/Roundup	2.2/1.0	100	100	100	100	100	227
Harness/Roundup	7.0/1.0	100	100	100	100	100	217
Degree/Roundup	7.0/1.0	100	100	100	100	100	229
Dual II Mag/Roundup	5.2/1.0	100	100	100	100	100	181
Topnotch/Roundup	7.0/1.0	100	100	100	100	100	208
Frontier/Roundup	4.4/1.0	100	100	100	100	100	224
Degree/Roundup	1.75/1.0	100	100	100	100	100	224
Dual II Mag/Roundup	1.3/1.0	100	100	100	100	95	225
Frontier/Roundup	1.1/1.0	100	100	100	100	100	198
Roundup/Roundup[d]	1.0/1.0	100	100	100	100	100	235
Atrazine	1.5	100	85	97	95	100	215
Weedy check		0	0	0	0	0	108

[a]First treatment applied preemergence and rated on June 7.

[b]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.

[c]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Saskr = Russian thistle.

[d]Treatments applied postemergence with AMS on June 6 and June 27 and rated on July 13.

two rows of each plot using a John Deere 3300 combine equipped with a load cell. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Weed control and injury evaluations: Weed control and crop injury evaluations are given in Tables 11 and 12. Stand counts are given in Table 11. In Table 11, Frontier applied preemergence followed by Roundup applied postemergence at 4.4/1.0 lb/ac had the highest crop injury rating of 67%. Degree, Dual II Mag, and Frontier applied preemergence at 1.75 and 3.5; 1.3, 2.6, and 5.2; and 1.1, 2.2, and 4.4 lb/ac, respectively, gave poor control of Russian thistle. All treatments except the check gave good to excellent control of common lambsquarters, redroot and prostrate pigweed, and black nightshade. In Table 12, postemergence applications of Roundup applied at 1.0 lb/ac gave good to excellent control of broadleaf weeds.

Crop yields: Yields are given in Table 12. Yields were 73 to 127 bu/ac higher in the herbicide treated plots as compared to the check.

Broadleaf weed control in spring-seeded alfalfa

Introduction

Seedling alfalfa requires effective broad-spectrum weed control for successful establishment; however, few herbicides are registered for postemergence broadleaf weed control. Since Pursuit was recently registered for broadleaf weed control in seedling alfalfa, field trials were conducted to evaluate broadleaf weed control and alfalfa tolerance to AC 299-263 alone or in combination and to Pursuit.

Objectives

- To determine efficacy of Raptor and Pursuit applied alone or in combination for control of broadleaf weeds in spring-seeded alfalfa.
- To determine alfalfa yield and tolerance to applied selected herbicides.

Materials and methods

A field experiment was conducted in 2000 on a Wall sandy loam (less than 1% organic matter) at Farmington,

Table 13. Control of Annual Broadleaf Weeds with Postemergence Applications of Raptor and Pursuit Applied Alone or in Combination in Spring-Seeded Alfalfa, July 12; NMSU Agricultural Science Center at Farmington, NM, 2000

		Crop	Weed Control[a,b]				
	Rate	Injury[a]	Solni	Amare	Amabl	Saskr	Cheal
Treatments	(lb/ac)	(%)	(%)				
Raptor[c]	0.032	0	100	100	100	70	89
Raptor[c]	0.04	0	100	100	100	92	95
Raptor[c]	0.047	0	100	100	100	97	97
Raptor[d]	0.032	0	100	100	100	96	100
Raptor[d]	0.04	0	100	100	100	100	100
Raptor[d]	0.047	0	100	100	100	95	99
Pursuit[d]	0.047	0	100	100	100	70	83
Pursuit + Select[d]	0.047 + 0.094	0	100	100	100	85	98
Pursuit[d]	0.064	0	100	100	100	92	95
Pursuit + Select[d]	0.064 + 0.094	0	100	100	100	98	98
Raptor + Select[d]	0.032 + 0.094	0	100	100	100	83	98
Raptor + Poast[d]	0.032 + 0.19	0	100	100	100	96	100
Pursuit + Poast[d]	0.047 + 0.19	0	100	100	100	98	84
Pursuit + Poast[d]	0.064 + 0.19	0	100	100	100	95	93
Buctril[c]	0.25	0	100	40	65	100	96
Weedy check		0	0	0	0	0	0
LSD 0.05		ns	1	12	8	6	7

[a]Based on visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.

[b]Solni = black nightshade, Amare = redroot pigweed, Amabl = prostrate pigweed, Saskr = Russian thistle, and Cheal = common lambsquarters.

[c]Treatments applied with NIS and 32-0-0 at 0.25% v/v and 1 qt/ac, respectively.

[d]Treatments applied with MSO and 32-0-0 at 1 qt/ac.

to evaluate the response of spring-seeded alfalfa and annual broadleaf weeds to postemergence applications of Raptor and Pursuit applied alone or in combination. The experimental design was a randomized complete block with three replications. Individual plots were 10 ft wide by 30 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 30 psi. Alfalfa (var. Legend) was planted at 20 lb/ac with a Massey Ferguson grain drill on May 17. Postemergence treatments were applied on June 12 when alfalfa was in the second trifoliolate leaf stage and weeds were small. Black nightshade, redroot and prostrate pigweed, and common lambsquarters infestations were heavy and Russian thistle infestations were light throughout the experimental area. Crop injury and weed control evaluations were made on July 12. Alfalfa was harvested with an Almaco self-propelled plot harvester on August 1. A grab sample was taken from each treatment in one replication after harvest to determine protein content. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Crop injury and weed control ratings: Results of crop injury and weed control evaluations are given in Table 13. In Table 14, black nightshade control was excellent with all treatments except the check. Redroot and prostrate pigweed were excellent with all treatments except Buctril applied at 0.25 lb/ac and the check. Raptor and Pursuit applied at 0.032 and 0.047 lb/ac, respectively, gave poor control of Russian thistle. Common lambsquarters control was good to excellent with all treatments except Pursuit applied alone at 0.047 or in combination with Poast at 0.19 lb/ac and the check.

Yield and protein content: Results of yield, protein content, and relative feed values are given in Table 14. The weedy check had the highest yield of 3.7 t/ac. This is possibly attributed to the heavy weed pressure during harvest. Protein content ranged from 2.7 to 11.3% higher in the herbicide treated plots as compared to the check. Buctril and the weedy check had the lowest relative feed value of 119 and 120, respectively.

Table 14. Control of Annual Broadleaf Weeds with Postemergence Applications of Raptor and Pursuit Applied Alone or in Combination in Spring-Seeded Alfalfa, August 1; NMSU Agricultural Science Center at Farmington, NM, 2000

Treatments	Rate (lb/ac)	Yield (t/ac)	REF[a] (no.)	Protein Content (%)
Raptor[b]	0.032	2.0	137	20.5
Raptor[b]	0.04	1.9	138	21.2
Raptor[b]	0.047	2.0	141	21.1
Raptor[c]	0.032	1.8	156	22.5
Raptor[c]	0.04	1.9	136	21.2
Raptor[c]	0.047	2.0	152	22.1
Pursuit[c]	0.047	2.2	139	21.0
Pursuit + Select[c]	0.047 + 0.094	1.9	142	21.7
Pursuit[c]	0.064	2.1	137	21.0
Pursuit + Select[c]	0.064 + 0.094	1.9	143	21.6
Raptor + Select[c]	0.032 + 0.094	2.0	157	21.7
Raptor + Poast[c]	0.032 + 0.19	1.9	146	22.9
Pursuit + Poast[c]	0.047 + 0.19	2.1	149	22.5
Pursuit + Poast[c]	0.064 + 0.19	2.3	138	21.6
Buctril[b]	0.25	2.6	119	14.3
Weedy check		3.7	120	11.6
LSD 0.05		0.8		

[a]REF = relative feed value.

[b]Treatments applied with NIS and 32-0-0 at 0.25% and 1 qt/ac, respectively.

[c]Treatments applied with MSO and 32-0-0 at 1 qt/ac.

A demonstration trial involving broadleaf weed control in dry beans

Introduction

Approximately 97% of New Mexico's dry bean production occurs in northwestern New Mexico. Most of this production occurs under sprinkler irrigation on coarse-textured soils. Pinto bean growers usually preplant incorporate one or two herbicides in combination and then follow with one mechanical cultivation for annual weed control. Weeds compete vigorously with dry beans, and yield reductions exceeding 70% have been recorded. Many growers are not achieving effective full-season weed control, which has led to the development of Pursuit for weed control in dry edible beans.

Objectives

- To determine broadleaf weed control to applied selected herbicides.
- To determine dry bean yield and tolerance to applied selected herbicides.

Materials and methods

A field demonstration trial was conducted in 2000 at Farmington, to evaluate the response of dry edible beans (var. Bill Z and Fleetwood) and annual broadleaf weeds to preplant applications of Sonalan, followed by preemergence applications of Frontier and Dual II Mag. Preplant applications of Sonalan were made on May 24 and roto-tilled in at a depth of 3 in. Preemergence treatments were applied on May 25 and immediately incorporated with 0.75 in. of sprinkler-applied water. Postemergence applications of Pursuit plus Basagran were banded over the top of beans on June 27. Soils were fertilized according to New Mexico State University recommendations based on soil tests. Individual plots were 4 (2 rows Bill Z and 2 rows Fleetwood) 34-in. rows 360 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 30 psi. Dry beans were planted with flexi-planters equipped with disk openers on May 24. Black nightshade and prostrate and redroot pigweed infestations were heavy and common lambsquarters and Russian thistle infestations were light throughout the experimental area. Preplant and preemergence treatments were evaluated on June 26. Postemergence treatments were evaluated on July 27. Dry beans were cut and left in the field one week before thrashing. Dry beans were harvested on August 21 by combining the two center rows of each plot.

Table 15. Control of Annual Broadleaf Weeds with Preplant Applications of Sonalan Followed by Preemergence Applications of Dual II Mag or Frontier, Followed by Cultivation and Postemergence Applications of Pursuit Plus Basagran, June 26; NMSU Agricultural Science Center at Farmington, NM, 2000

		Weed Control[a,b]				
	Rate	Cheal	Amare	Amabl	Solni	Saskr
Treatments	(lb/ac)	(%)				
Sonalan + Dual II Mag[c]/Pursuit + Basagran[d]	0.94 + 1.25/0.023 + 0.5	100	100	100	100	100
Sonalan + Frontier[c]/Pursuit + Basagran[d]	0.94 + 1.0/0.032 0.5	100	100	100	100	100
Dual II Mag[c]/Pursuit + Basagran[c]	1.25/0.032 + 0.5	75	97	98	75	40
Frontier[c]/Pursuit + Basagran[c]	1.0/ 0.032 + 0.5	76	97	95	84	50
Weedy check		0	0	0	0	0

[a]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.

[b]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Saskr = Russian thistle.

[c]Sonalan was applied preplant incorporated and Dual II Mag and Frontier were applied preemergence.

[d]First treatments applied preplant incorporated and preemergence and rated on June 26, second treatments applied postemergence with COC at 1 p/ac.

[e]First treatments applied preplant incorporated and preemergence and rated on June 26, second treatments applied postemergence with MSO at 1 pt/ac.

Table 16. Control of Annual Broadleaf Weeds with Preplant Applications of Sonalan Followed by Preemergence Applications of Dual II Mag or Frontier, Followed by Cultivation and Postemergence Applications of Pursuit Plus Basagran, July 27; NMSU Agricultural Science Center at Farmington, NM, 2000

		Weed Control[a,b]					Bill Z	Fleetwood
	Rate	Cheal	Amare	Amabl	Solni	Saskr	Yield	Yield
Treatments	(lb/ac)	(%)					(lb/ac)	(lb/ac)
Sonalan + Dual II Mag[c]/ Pursuit + Basagran[d]	0.94 + 1.25/ 0.023 + 0.5	100	100	100	100	100	2,827	2,698
Sonalan + Frontier[c]/ Pursuit + Basagran[d]	0.94 + 1.0/ 0.032 + 0.5	100	100	100	100	100	2,698	2,827
Dual II Mag[c]/Pursuit + Basagran[e]	1.25/0.032 + 0.5	97	100	97	92	78	2,827	2,442
Frontier[c]/Pursuit + Basagran[e]	1.0/0.032 + 0.5	98	97	95	96	85	2,698	2,827
Weedy check		0	0	0	0	0	650	620

[a]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.

[b]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Saskr = Russian thistle.

[c]Sonalan was applied preplant incorporated and Dual II Mag and Frontier were applied preemergence.

[d]First treatments applied preplant incorporated and preemergence, second treatments applied postemergence with COC at 1 p/ac and rated on July 27.

[e]First treatments applied preplant incorporated and preemergence, second treatments applied postemergence with MSO at 1 pt/ac and rated on July 27.

Results and discussion

Weed control evaluations: Weed control evaluations are given in Tables 15 and 16. In Table 15, the combination of Sonalan either with Dual II Mag or Frontier increased broadleaf weed control as compared with Dual II Mag or Frontier applied alone. In Table 16, Pursuit plus Basagran with COC or MSO increased broadleaf weed control over Dual II Mag or Frontier used alone.

Crop yields: Yields are given in Table 16. Bill Z and Fleetwood yields were 2,048 to 2,177 lb/ac and 1,822 to 2,178 higher, respectively, in the herbicide treated plots as compared to the check.

Broadleaf weed control in sunflowers

Introduction

Sunflower is a crop that is usually planted in dry land situations under limited rainfall. Sunflower seed is mainly harvested for its oil content. The sunflower is adapted for seed production where corn is successful in the northern two-thirds of the U.S. Little information is available for the use of herbicides for control of broadleaf weeds in sunflower on coarse-textured soils.

Table 17. Control of Annual Broadleaf Weeds in Sunflowers with a Preplant Incorporated Treatment of Sonalan, and Preemergence Applications of Spartan Applied Alone or in Combination with Dual II Mag; NMSU Agricultural Science Center at Farmington, NM, 2000

		Weed control[a,b]				
	Rate	Amare	Amabl	Solni	Cheal	Saskr
Treatments	lb/ac	(%)				
Spartan[c]	0.094	98	98	100	96	92
Sonalan[d]	0.94	100	96	88	100	92
Dual II Mag[c]	1.25	98	95	82	90	40
Dual II Mag + Spartan[c]	1.0 + 0.094	100	100	98	100	90
Check	0	0	0	0	0	0

[a]Based on a scale from 0-100, where 0 = no control and 100 = dead plants.

[b]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

[c]Treatments applied preemergence.

[d]Treatment applied preplant incorporated.

Table18. Control of Annual Broadleaf Weeds in Sunflowers with a Preplant Incorporated Treatment of Sonalan, and Preemergence Applications of Spartan Applied Alone or in Combination with Dual II Mag; NMSU Agricultural Science Center at Farmington, NM, 2000

		Weed control[a,b]					
	Rate	Amare	Amabl	Solni	Cheal	Saskr	Yield
Treatments	(lb/ac)	(%)					(lb/ac)
Spartan[c]	0.094	93	90	90	94	88	4,275
Sonalan[d]	0.94	97	90	75	96	92	3,995
Dual II Mag[c]	1.25	92	90	70	85	30	3,150
Dual II Mag + Spartan[c]	1.0 + 0.094	98	96	96	96	85	4,310
Check		0	0	0	0	0	1,565

[a]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.

[b]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

[c]Treatments applied preemergence.

[d]Treatment applied preplant incorporated.

Objectives

- To determine efficacy of selected herbicides for control of annual broadleaf weeds in sunflowers.
- To determine sunflower yield and tolerance to applied selected herbicides.

Materials and methods

A field demonstration trial was conducted in 2000 at Farmington, to evaluate the response of sunflowers (NK 278) and annual broadleaf weeds to preplant incorporated applications of Sonalan, and preemergence applications of Spartan applied alone or in combination with Dual II Mag. Sunflowers were planted on May 24 with flexi-planters equipped with disk openers. Soils were fertilized according to New Mexico State University recommendations based on soil tests. Plots were 4 34-in. rows 360 ft long. The preplant incorporated treatments were applied on May 24 and disked in to a depth of 3 in. Preemergence applications were applied on May 25 and immediately incorporated with 0.75 in. of sprinkler-applied water. Crop injury and weed control evaluations were made on June 28 and July 28. Black nightshade and prostrate and redroot pigweed infestations were heavy and common lambsquarters and Russian thistle infestations were light throughout the experimental area. Sunflowers were harvested for yield on September 25 by combing the two center rows from each plot using a John Deere 3300 combine equipped with a load cell.

Results and discussion

Weed control evaluations: Weed control and crop injury evaluations are given in Tables 17 and 18. None of the treatments caused any noticeable crop injury. All treatments gave good to excellent control of redroot and prostrate pigweed and common lambsquarters. Dual II Mag gave poor control of black nightshade and Russian thistle (Table 17). In Table 18, Dual II Mag gave poor control of black nightshade and Russian thistle.

Crop yields: Yields are given in Table 18. Yields were 1,585 to 2,710 lb/ac higher in the herbicide treated plots as compared to the check.

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