Pest Control in Crops Grown in Northwestern New Mexico, 2005

Annual Data Report 100-2005

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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).

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.

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

Introduction

Many herbicides can be used in sequential treatments. These 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

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

Materials and methods

A field experiment was conducted in 2005 at Farmington, NM, to evaluate the response of field corn (var. Pioneer 34N45) and annual broadleaf weeds to preemergence and 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 four replications. Individual plots were four 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 16. The preemergence treatments were applied on May 17 and immediately incorporated with 0.75 in. of sprinkler-applied water. Sequential postemergence treatments were applied on June 9 when field corn was in the 4th leaf stage and weeds were small (<2 in.). Black nightshade and redroot and prostrate pigweed infestations were heavy and Russian thistle and common lambsquarters infestations were light throughout the experimental area. Preemergence and preemergence followed by sequential postemergence treatments were evaluated visually on June 9 and July 11. Crop injury was evaluated on June 9. Stand counts were made on June 9 by counting individual plants per 10 ft of the third row of each plot. Field corn was harvested on November 29 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: Crop injury evaluations and stand counts are given in Table 1. Weed control evaluations are given in Tables 1 and 2. Outlook applied preemergence at 0.75 lb ai/ac had the highest injury level of 11. All treatments except the check gave excellent control of redroot and prostrate pigweed, black nightshade, and common lambsquarters. Outlook and Dual II Mag, applied preemergence at 0.75 and 1.25 lb ai/ac gave poor control of Russian thistle. The addition of Distinct at 0.25 lb ai/ac to either Outlook or Dual II Mag increased Russian thistle control by approximately 52% (Table 2).

Crop yields: Yields are given in Table 2. Yields were 142 to 180 bu/ac higher in herbicide-treated plots as compared to the check.

Corn emergence and broadleaf weed control in Roundup Ready field corn with preemergence and preemergence followed by sequential postemergence herbicides

Introduction

Many herbicides can be used in sequential treatments. These 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

- Determine seedling emergence and efficacy of selected herbicides for control of annual broadleaf weeds in field corn.
- Determine corn yield and tolerance to applied selected herbicides.

Materials and methods

A field experiment was conducted in 2005 at Farmington, NM, to evaluate the response of Roundup Ready field corn (var. Dekalb 60-19RR) to seedling emergence and annual broadleaf weeds to preemergence and 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 four replications. Individual plots were four 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 17. The preemergence treatments were applied on May 18 and immediately incorporated with 0.75 in. of sprinkler-applied water. Sequential postemergence treatments were applied on June 10 when field corn was in the 4th leaf stage and weeds were small (<2 in.). Black nightshade and redroot and prostrate pigweed infestations were heavy and Russian thistle and common lambsquarters infestations were light throughout the experimental area. Preemergence and preemergence followed by sequential postemergence treatments were evaluated visually on June 9 and July 11. Crop injury was evaluated on June 8. Seedling emergence evaluations were made on May 25, 27, and 29 by counting individual plants per 10 ft of the center two rows of each plot. Field corn was harvested on November 29 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 seedling emergence evaluations: Seedling emergence evaluations are given in Table 3. Weed control evaluations are given in Tables 3 and 4. There was no significant difference in seedling emergence for May 25. Harness Xtra at 1.35 and 2.7 lb ai/ac had the lowest emerged seedlings for May 23. On May 27, Bicep Lite II Mag applied at 1.65 lb ai/ac had the highest emerged seedlings of 44.8. Broadleaf weed control was excellent with all treatments except the check. Even though Roundup WeatherMAX was applied as a sequential postemergence treatment at 1.12 lb ai/ac, preemergence broadleaf weed control with Harness Xtra, Guardsman max, Bicep Lite II Mag, and Lumax applied at 2.7 and 1.35, 1.9, 1.65 and 2.47 lb ai/ac was still 93% or greater by July 11. Broadleaf weed control was still 93% or greater by July 11.

Crop yields: Yields are given in Table 4. Yields were 172 to 217 bu/ac higher in herbicide-treated plots as compared to the check.

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

Introduction

Many herbicides can be used in sequential treatments. These 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

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

Materials and methods

A field experiment was conducted in 2005 at Farmington, NM, to evaluate the response of Roundup Ready field corn (Dekalb 60-19RR) 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 four 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 16. Preemergence herbicides were applied on May 17 and immediately incorporated with 0.75 in. of sprinkler-applied water. Postemergence treatments were applied on June 9 when field corn was in the 4th leaf stage and weeds were small (<2 in.). Black nightshade and redroot and prostrate pigweed infestations were heavy and common lambsquarters infestations were moderate, and Russian thistle infestations were light throughout the experimental area. Preemergence and preemergence followed by sequential postemergence treatments were evaluated visually on June 9 and July 11. Crop injury was evaluated on June 9. Stand counts were made on June 9 by counting individual plants per 10 ft of the third row of each plot. Field corn was harvested on November 29 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 5 and 6. Basis plus atrazine applied preemergence at 0.0469 plus 1.0 lb ai/ac had the highest injury rating of 20. Preemergence broadleaf weed control was excellent with all treatments except the weedy check. Roundup WeatherMAX applied postemergence at 0.94 lb ai/ac was the only treatment that gave poor control of Russian thistle Table 6.

Crop yields: Yields are given in Table 6. Yields were 87 to 152 bu/ac higher in herbicide-treated plots as compared to the check.

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, Raptor, and recently Valor for weed control in dry edible beans.

Objectives

- Determine broadleaf weed control with applied selected herbicides.
- Determine dry bean yield and tolerance to applied selected herbicides.

Materials and methods

A field experiment was conducted in 2005 at Farmington, NM, to evaluate the response of dry edible beans (var. Bill Z) and annual broadleaf weeds to preemergence and 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 four replications. Individual plots were four 34-in. rows 30 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 on May 26. Preemergence treatments were applied on May 27 and immediately incorporated with 0.75 in. of sprinkler-applied water.

Sequential postemergence treatments were applied on June 30 after cultivation when dry beans were in the 4th trifoliolate leaf stage and weeds were small (<2 in.). 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. Crop injury evaluations were made on June 29. Preemergence treatments were evaluated on June 29 and July 29. Preemergence followed by sequential postemergence treatments were evaluated on July 29. Dry beans were hand harvested on August 29 and left in the field until September 7 when they were thrashed and weighed. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Weed control evaluations: Weed control evaluations are given in Tables 7 and 8. Only Valor and Outlook in combination with Prowl H_2O at 0.05, 0.56, and 0.8 lb ai/ac showed injury symptoms of <2% (data not shown). All treatments gave excellent control of redroot and prostrate pigweed, common lambsquarters, and black nightshade. Russian thistle control was poor with those preemergence treatments containing Outlook, Prowl, and Prowl H_2O, regardless of rate and combination. Valor applied preemergence at 0.05 lb ai/ac gave excellent control of Russian thistle (Table 7). All treatments gave 89% control of redroot and prostrate pigweed, common lambsquarters, and black nightshade. Russian thistle control increased significantly when Raptor plus Basagran at 0.023 plus 0.25 lb ai/ac was included as a sequential postemergence treatment to preemergence treatments of Outlook, Prowl, and Prowl H_2O (Table 8).

Crop yields: Yields are given in Table 8. Yields were 2,305 to 4,035 lb/ac higher 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 dryland situations under limited rainfall. Sunflower seed is mainly harvested for its oil content. The sunflower is adapted for oil seed production where corn is successful in the northern two-thirds of the U.S. Little information is available on the use of herbicides for control of broadleaf weeds in sunflower on coarse-textured soils.

Objectives

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

Materials and methods

A field demonstration trial was conducted in 2005 at Farmington, NM, to evaluate the response of sunflowers (var. 8010, 8050, 7015, and 8020) and annual broadleaf weeds to preemergence herbicides. Sunflowers were planted on May 31 with flexi-planters equipped with disk openers. Soils were fertilized according to New Mexico State University recommendations based on soil tests. Plots were four 34-in. rows 60 ft long. Preemergence herbicides were applied on June 1 and immediately incorporated with 0.75 in. of sprinkler-applied water. Crop injury and weed control evaluations were made on July 1 and August 4. 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 October 12 and 13 by hand harvesting 2 rows 10 ft in length from the center of each plot. Sunflowers were then shelled by hand and weighed.

Results and discussion

Weed control and injury evaluations: Crop injury evaluations are given in Table 9. Weed control evaluations are given in Tables 10 and 11. Varieties 8050 and 7015 did not show any crop injury from Dual II Mag plus Prowl at 1.25 plus 0.8 lb ai/ac. Varieties 8010 and 8020 showed considerable damage form all treatments except the weedy check. Weed control was good to excellent with all treatments at both rating periods except the weedy check. Russian thistle control was poor at both rating periods with Outlook or Dual II Mag in combination with Prowl (Tables 10 and 11).

Crop yields: Crop yields are given in Table 12. Variety 7015 had the highest seed yields of any of the herbicide treatments, ranging from 4,611 to 4,918 lb/ac.

Russian knapweed and Canada thistle control in Montezuma County, Colorado

Introduction

Today, over 100 million acres on the North American continent are struggling against invasive, non-native plants that have no respect for property boundaries. This invasion poses a serious threat to the integrity and productivity of our nation's landscape. One such invasive noxious weed is Russian knapweed, which has spread tremendously throughout San Juan County, NM, and southwestern Colorado.

Objectives

- Determine efficacy of selected herbicides for control of Russian knapweed and Canada thistle in Montezuma County, Colorado.

Materials and methods

A field experiment was conducted in 2005 in Montezuma County, CO, to evaluate the response of Russian knapweed and Canada thistle to selected herbicides applied postemergence. The experimental design was a randomized complete block with three replications. Individual plots were 12 ft wide by 25 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 30 psi. Treatments were applied on April 14 when Russian knapweed was 2 in. or less in height. Russian knapweed had been mowed before treatments were applied. Treatments were rated approximately two months after treatment on June 2. Treatments were applied on September 29, 2004, and April 14, 2005, for Canada thistle control. Treatments were rated on June 2, 2005, approximately nine months after fall and 2 months after spring treatments. All treatments were applied with a COC at 1% v/v.

Results and Discussion

Weed control evaluations: Weed control and grass injury evaluations for Russian knapweed and Canada thistle control are given in Tables 13 and 14. Ally plus Telar plus 2, 4-D applied at 0.009 plus 0.005 plus 0.5 lb ai/ac had the highest grass injury rating of 7. Telar applied alone at 0.012 lb ai/ac or in combination with Ally plus Weedmaster applied at 0.023 plus 0.009 plus 0.48 lb ai/ac gave poor control of Russian knapweed (Table 13). All treatments except the weedy check gave good to excellent control of Canada thistle, whether applied fall or spring. The spring treatments gave approximately 2 to 13% better control of Canada thistle than did fall treatments (Table 14).

Table 1. Control of Annual Broadleaf Weeds with Preemergence and Preemergence Followed by Sequential Postemergence Herbicides in Field Corn on June 9; NMSU Agricultural Science Center at Farmington, NM, 2005

Treatments[a]	Rate (lb/ac)	Crop Injury[b] (%)	Stand Count (no.)	Weed Control[b,c] Amare (%)	Amabl	Solni	Cheal	Saskr
Guardsman Max (pm)	0.85	0	22	98	100	0 97	100	96
Guardsman Max (pm)	1.9	3	22	100	100	100	100	100
Bicep Lite II Mag (pm)	0.83	0	21	100	100	98	100	97
Bicep Lite II Mag (pm)	1.65	0	21	100	100	100	100	100
Outlook	0.75	11	19	100	100	98	100	53
Dual II Mag	1.25	0	22	100	100	96	100	57
Outlook/Distinct[b,c]	0.75/0.25	9	21	100	100	97	100	48
Outlook + Prowl H_20/Distinct[b,c]	0.75 + 1.0/0.17	10	21	100	100	97	100	84
Guardsman Max (pm) + Prowl H_20	1.9 + 1.0	7	22	100	100	97	100	99
Guardsman Max (pm)+ Prowl H_20/Distinct[b,c]	1.9 + 1.0/0.17	7	19	100	100	98	100	98
Dual II Mag/Distinct[b,c]	1.25/0.25	0	22	100	100	97	100	56
Weedy check		0	22	0	0	0	0	0
LSD 0.05		2	2	1	1	2	1	5

[a]pm = packaged mix.
[b]First treatment applied preemergence followed by a sequential postemergence treatment.
[c]Sequential postemergence treatment applied with NIS and 32-0-0 at 0.25% and 1.0% v/v, respectively.
[d]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.
[e]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 2. Control of Annual Broadleaf Weeds with Preemergence and Preemergence Followed by Sequential Postemergence Herbicides in Field Corn on July 11; NMSU Agricultural Science Center at Farmington, NM, 2005

Treatments[a]	Rate (lb/ac)	Weed Control[b,c] Amare (%)	Amabl	Solni	Cheal	Saskr	Yield (bu/ac)
Guardsman Max (pm)	0.85	92	92	92	99	93	292
Guardsman Max (pm)	1.9	98	99	98	100	99	287
Bicep Lite II Mag (pm)	0.83	95	95	96	99	91	276
Bicep Lite II Mag (pm)	1.65	98	99	98	100	99	279
Outlook	0.75	93	93	94	99	55	278
Dual II Mag	1.25	97	92	93	99	55	274
Outlook/Distinct[b,c]	0.75/0.25	99	100	99	100	100	274
Outlook + Prowl H_20/Distinct[b,c]	0.75 + 1.0/0.17	100	100	99	100	100	257
Guardsman Max (pm) + Prowl H_20	1.9 + 1.0	98	99	99	99	98	279
Guardsman Max (pm) + Prowl H_20/Distinct[b,c]	1.9 + 1.0/0.17	98	100	99	100	100	264
Dual II Mag/Distinct[b,c]	1.25/0.25	99	99	99	100	100	254
Weedy check		0	0	0	0	0	112
LSD 0.05		3	2	2	1	4	15

[a]pm = packaged mix.
[b]First treatment applied preemergence followed by a sequential postemergence treatment.
[c]Sequential postemergence treatment applied with NIS and 32-0-0 at 0.25% and 1.0% v/v, respectively.
[d]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.
[e]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 3. Seedling Emergence and Control of Annual Broadleaf Weeds with Preemergence and Preemergence Followed by Sequential Postemergence Herbicides in Roundup Ready Field Corn on June 9; NMSU Agricultural Science Center at Farmington, NM, 2005

		Seedling Emergence			Weed Control[b,c]				
	Rate	5-23	5-25	5-27	Amare	Amabl	Solni	Cheal	Saskr
Treatments[a]	(lb/ac)	(no.)	(no.)	(no.)			(%)		
Lumax (pm)	2.47	9.0	35.3	43.3	100	100	100	100	100
Bicep Lite II Mag (pm)	1.65	10.5	36.5	44.8	100	100	100	100	100
Harness Xtra (pm)	2.7	5.7	33.0	41.8	100	100	100	100	100
Guardsman Max (pm)	1.9	14.3	33.5	42.8	100	100	100	100	100
Harness Xtra (pm)/Roundup WeatherMAX[b]	1.35/1.12	3.0	32.0	43.3	100	100	100	100	100
Harness Xtra (pm)/Roundup WeatherMAX[b]	2.7/1.12	12.5	27.8	41.8	100	100	100	100	100
Bicep Lite II Mag (pm)/Callisto[b,c]	1.65/0.094	14.0	30.8	43.5	100	100	100	100	100
Guradsman Max (pm)/Roundup WeatherMAX[b]	1.9/1.12	10.2	22.0	39.0	100	100	100	100	100
Guardsman Max (pm)/Callisto[b,c]	1.9/0.094	11.3	26.3	41.3	100	100	100	100	100
Bicep Lite II Mag (pm)/Roundup WeatherMAX[b]	1.65/1.12	9.8	36.0	44.8	100	100	100	100	100
Steadfast ATZ (pm) + Clarity[d]	0.78 + 0.125	15.5	34.3	42.5	0	0	0	0	0
Weedy check		14.5	34.8	42.0	0	0	0	0	0
LSD 0.05		7	ns	2.8	1	1	1	1	1

[a]pm = packaged mix.
[b]First treatment applied preemergence followed by a sequential postemergence treatment.
[c]Sequential postemergence treatment applied with COC and 32-0-0 at 1.0% and 2.5% v/v, respectively.
[d]Treatment applied postemergence with a COC and AMS at 1.0% and 2% v/v.
[e]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.
[f]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 4. Control of Annual Broadleaf Weeds with Preemergence and Preemergence Followed by Sequential Postemergence Herbicides in Roundup Ready Field Corn on July 11; NMSU Agricultural Science Center at Farmington, NM, 2005

		Weed Control[b,c]					
	Rate	Amare	Amabl	Solni	Cheal	Saskr	Yield
Treatments[a]	(lb/ac)			(%)			(bu/ac)
Lumax (pm)	2.47	99	100	97	100	99	281
Bicep Lite II Mag (pm)	1.65	97	100	93	99	95	275
Harness Xtra (pm)	2.7	99	100	97	99	98	264
Guardsman Max (pm)	1.9	98	99	98	100	98	286
Harness Xtra (pm)/Roundup WeatherMAX[b]	1.35/1.12	98	100	98	100	95	286
Harness Xtra (pm)/Roundup WeatherMAX[b]	2.7/1.12	99	99	99	100	99	280
Bicep Lite II Mag (pm) Callisto[b,c]	1.65/0.09	100	100	99	100	99	287
Guardsman Max (pm)/Roundup WeatherMAX[b]	1.9/1.12	99	100	97	100	98	242
Guardsman Max (pm)/Callisto[b,c]	1.9/0.094	99	100	99	100	100	281
Bicep Lite II Mag (pm)/Roundup WeatherMAX[b]	1.65/1.12	100	100	99	100	98	28
Steadfast ATZ (pm) + Clarity[d]	0.78 + 0.125	99	99	100	99	100	283
Weedy check		0	0	0	0	0	70
LSD 0.05		2	1	2	1	2	16

[a]pm = packaged mix.
[b]First treatment applied preemergence followed by a sequential postemergence treatment.
[c]Sequential postemergence treatment applied with COC and 32-0-0 at 1.0% and 2.5% v/v, respectively.
[d]Treatment applied postemergence with a COC and AMS at 1.0% and 2% v/v, respectively.
[e]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.
[f]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 5. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence and Postemergence Herbicides in Roundup Ready Field Corn on June 9; NMSU Agricultural Science Center at Farmington, NM, 2005

Treatments[a]	Rate (lb/ac)	Stand Count (no.)	Crop Injury (%)	Weed Control[b,c] Amare (%)	Amabl	Solni	Saskr	Cheal
Basis/Roundup WeatherMAX	0.0156	22	1.0	100	100	100	100	100
Basis/Roundup WeatherMAX	0.0313	21	9.3	100	100	98	99	100
Basis/Roundup WeatherMAX	0.0469	21	18.7	100	100	100	100	100
Basis + atrazine/Roundup WeatherMAX	0.0156 + 1.0	21	2.3	100	100	100	100	100
Basis + atrazine/Roundup WeatherMAX	0.0313 + 1.0	21	12.7	100	100	100	100	100
Basis + atrazine/Roundup WeatherMAX	0.0469 + 1.0	21	20.0	100	100	100	100	100
Harness Xtra/Roundup WeatherMAX	2.25	22	0	100	100	100	100	100
Cinch ATZ/Steadfast + Callisto + atrazine	1.03	21	0	100	100	100	100	100
Weedy check		22	0	0	0	0	0	0
LSD 0.05		ns	1	1	1	1	1	1

[a]First treatment applied preemergence and rated on June 9.
[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.

Table 6. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence and Postemergence Herbicides in Roundup Ready Field Corn on July 11; NMSU Agricultural Science Center at Farmington, NM, 2005

Treatments[a]	Rate (lb/ac)	Weed Control[b,c] Amare (%)	Amabl	Solni	Cheal	Saskr	Yield (bu/ac)
Basis/Roundup WeatherMAX	0.0156/0.94	100	100	100	100	100	275
Basis/Roundup WeatherMAX	0.0313/0.94	100	100	100	100	100	25
Basis/Roundup WeatherMAX	0.0469/0.094	100	100	100	100	100	251
Basis + atrazine/Roundup WeatherMAX	0.0156 + 1.0/0.94	100	100	100	100	100	267
Basis + atrazine/Roundup WeatherMAX	0.0313 + 1.0/0.94	100	100	100	100	100	234
Basis + atrazine/Roundup WeatherMAX	0.0469 + 1.0/0.94	100	100	100	100	100	267
Harness Xtra/Roundup WeatherMAX	2.25/0.94	100	100	100	100	100	266
Cinch ATZ/Steadfast + Callisto + atrazine	1.03/0.035 + 0.047 + 0.75	100	100	100	100	100	253
Roundup WeatherMAX[b]	0.94	91	94	94	67	94	210
Roundup WeatherMAX + DPX E9636 + DPX X4145[b]	0.94 + 0.0156 + 0.0156	100	100	100	100	100	255
Roundup WeatherMAX + DPX E9636 + Harmony GT+ DPX X4145[b]	0.94 + 0.0156 + 0.003 + 0.0156	100	100	100	100	100	273
Roundup WeatherMAX + DPX E9636 + Clarity + DPX X4145[b]	0.94 + 0.0156 + 0.125 + 0.0156	100	100	100	100	100	253
Roundup WeatherMAX + DPX E9636 + atrazine + DPX X4145	0.94 + 0.0156 + 0.5 + 0.0156	100	100	100	100	100	275
Roundup WeatherMAX + Harness[b]	0.094 + 1.31	100	100	100	100	100	248
Steadfast + Callisto + atrazine[b]	0.94 + 0.47 + 0.75	100	100	100	100	100	253
Weedy check		0	0	0	0	0	123
LSD 0.05		3	1	1	2	2	25

[a]First treatment applied preemergence followed by a slash then a postemergence treatment, rated on July 11.
[b]Treatments applied postemergence with ammonium sulfate at 2.0 lb/ac.
[c]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.
[d]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 7. Control of Annual Broadleaf Weeds in Dry Beans with Preemergence and Preemergence Followed by Sequential Postemergence Treatments on June 29; NMSU Agricultural Science Center at Farmington, NM, 2005

		Weed Control[b,c]				
	Rate	Cheal	Amare	Amabl	Solni	Saskr
Treatments	(lb/ac)	(%)				
Valor	0.05	100	100	100	100	100
Outlook	0.56	100	100	100	98	33
Valor + Prowl	0.05 + 0.8	100	100	100	100	99
Valor + Prowl H_2O	0.05 + 0.8	100	100	100	100	100
Outlook + Prowl	0.56 + 0.8	100	100	100	100	60
Outlook + Prowl H_2O	0.05 + 0.8	100	100	100	100	100
Outlook + Prowl	0.56 + 0.8	100	100	100	100	65
Valor/Raptor + Basagran[a]	0.05/0.032 + 0.25	100	100	100	100	99
Outlook/Raptor + Basagran[a]	0.56/0.032 + 0.25	100	100	100	98	51
Outlook + Prowl/Raptor + Basagran[a]	0.56 + 0.8/0.032 + 0.25	100	100	100	100	66
Outlook + Prowl/H_2O	0.05 + 0.8	100	100	100	100	100
Outlook + Prowl/Raptor + Basagran[a]	0.56 + 0.8/0.032 + 0.25	100	100	100	100	63
Valor + Prowl H_2O	0.05 + 0.8	100	100	100	100	100
Outlook + Prowl/Raptor + Basagran[a]	0.05 + 0.8/0.032 + 0.25	100	100	100	100	100
Weedy check		0	0	0	0	0
LSD 0.05		1	1	1	0.5	7

[a]First treatment applied preemergence followed by a sequential postemergence treatment. Postemergence treatments were applied with a COC and 32-0-0 at 0.5% and 2% v/v, respectively.
[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, and Saskr = Russian thistle.

Table 8. Control of Annual Broadleaf Weeds in Dry Beans with Preemergence and Preemergence Followed by Sequential Postemergence Treatments on July 29; NMSU Agricultural Science Center at Farmington, NM, 2005

		Weed Control[b,c]					Bill Z
	Rate	Amare	Amabl	Solni	Cheal	Saskr	Yield
Treatments	(lb/ac)	(%)					(lb/ac)
Valor	0.05	98	96	98	97	97	4534
Outlook	0.56	96	91	97	88	28	2881
Valor + Prowl	0.05 + 0.8	99	97	99	96	98	4303
Valor + Prowl H_2O	0.05 + 0.8	99	95	98	97	98	4342
Outlook + Prowl	0.56 + 0.8	97	93	96	92	33	3304
Outlook + Prowl H_2O	0.56 + 0.8	98	93	98	92	60	3304
Valor/Raptor + Basagran[a]	0.05/0.032 + 0.25	98	99	100	99	98	4303
Outlook/Raptor + Basagran[a]	0.56/0.032 + 0.25	98	99	99	99	91	4611
Outlook + Prowl/Raptor + Basagran[a]	0.56 + 0.8/0.032 + 0.25	98	100	99	99	94	4265
Outlook + Prowl H_2O/Raptor + Basagran[a]	0.56 + 0.8/0.032 + 0.25	99	98	99	99	93	4265
Valor + Prowl H_2O/Raptor + Basagran[a]	0.05 + 0.8/0.032 + 0.25	99	98	99	99	99	4265
Weedy check		0	0	0	0	0	576
LSD 0.05		2	3	2	3	5	922

[a]First treatment applied preemergence followed by a sequential postemergence treatment. Postemergence treatments were applied with a COC and 32-0-0 at 0.5% and 2% v/v, respectively.
[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.

Table 9. Sunflower Injury with Preemergence Herbicides, July 1; NMSU Agricultural Science Center at Farmington, NM, 2005

		Crop Injury[a]			
	Rate	8010	8050	7015	8020
Treatments	(lb/ac)	(%)			
Outlook + Prowl	0.75 + 0.8	95	80	35	95
Dual Mag + Prowl	1.25 + 0.8	25	0	0	25
Prowl + Spartan	0.8 + 0.13	30	0	60	70
Outlook + Spartan	0.75 + 0.13	95	65	55	45
Dual Mag + Spartan	1.25 + 0.13	98	50	35	50
Weedy check	1.25 + 0.125	0	0	0	0

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

Table 10. Control of Annual Broadleaf Weeds in Sunflowers with Preemergence Herbicides, July 1; NMSU Agricultural Science Center at Farmington, NM, 2005

		Weed Control[a,b]				
	Rate	Amare	Amabl	Solni	Cheal	Saskr
Treatments	(lb/ac)	(%)				
Outlook + Prowl	0.75 + 0.8	100	98	98	96	50
Dual Mag + Prowl	1.25 + 0.8	100	100	95	98	36
Prowl + Spartan	0.75 + 1.0	100	100	98	100	100
Outlook + Spartan	1.25 + 1.0	97	97	100	98	99
Dual Mag + Spartan	0.75 + 0.125	99	99	98	99	100
Weedy check	1.25 + 0.125	0	0	0	0	0

[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.

Table 11. Control of Annual Broadleaf Weeds in Sunflowers with Preemergence Herbicides, August 4; NMSU Agricultural Science Center at Farmington, NM, 2005

		Weed Control[a,b]				
	Rate	Amare	Amabl	Solni	Cheal	Saskr
Treatments	(lb/ac)	(%)				
Outlook + Prowl	0.75	95	95	95	92	42
Dual Mag + Prowl	1.25	96	98	93	95	26
Prowl + Spartan	0.75 + 1.0	98	99	94	97	93
Outlook + Spartan	1.25 + 1.0	96	96	98	99	95
Dual Mag + Spartan	0.75 + 0.125	96	96	95	98	96
Weedy check	1.25 + 0.125	0	0	0	0	0

[a]Based on a visual scale 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.

Table 12. Yield of 8010, 8050, 7015, and 8020 Sunflower Varieties Harvested on October 12 and 13; NMSU Agricultural Science Center at Farmington, NM, 2005

		Yield			
	Rate	8010	8050	7015	8020
Treatments	(lb/ac)	(lb/ac)			
Outlook + Prowl	0.75 + 0.8	1,383	4,611	4,611	1,383
Dual Mag + Prowl	1.25 + 0.8	4,457	3,535	4,764	3,535
Prowl + Spartan	0.8 + 0.13	2,920	4,611	4,764	2,459
Outlook + Spartan	0.75 + 0.13	3,074	4,457	4,764	1,537
Dual Mag + Spartan	1.25 + 0.13	3,227	3,535	4,918	2,151
Weedy check	1.25 + 0.125	1,383	1,229	1,075	1,229

Table 13. Control of Russian Knapweed at Billy Blackmer's Ranch with Selected Herbicides Applied Postemergence on April 14 and Rated on June 2; Montezuma County, CO, 2005

Treatments[a]	Rate (lb ai/ac)	Grass injury (%)	Weed Control Cenre[b] (%)
Ally + Telar	0.009 + 0.012	0	70
Ally + Telar	0.019 + 0.023	0	76
Ally + Telar	0.038 + 0.046	1	99
Ally + Telar + 2,4-D	0.009 + 0.005 + 0.5	7	97
Ally + Telar + 2,4-D	0.019 + 0.012 + 1.0	0	93
Ally + Telar + 2,4-D	0.038 + 0.023 + 2.0	3	96
Ally + Telar + Weedmaster	0.009 + 0.023 + 0.48	3	43
Ally + Telar + Weedmaster	0.019 + 0.046 + 0.96	0	100
Ally + Telar + Weedmaster	0.038 + 0.09 + 1.92	0	98
Telar	0.012	0	22
Telar	0.023	0	100
Telar	0.047	0	99
Grazon P + D	1.27	0	94
Weedy check		0	0
LSD 0.05		ns	25

[a]Treatments applied postemergence on April 14.
[b]Cenre = Russian knapweed, rated on June 2.

Table 14. Control of Canada Thistle at Jim Riffey's Ranch with Selected Herbicides Applied Postemergence on September 29, 2004, and April 14, 2005, and Rated on June 2; Montezuma County, CO, 2005

Treatments	Rate (lb ai/ac)	Grass Injury[a] (%)	Cirar Control[b] 9-29-04[c]	Cirar Control[b] 4-14-05[c]
			6-2-05[d] (%)	
Telar + Escort + 2,4-D	0.018 + 0.023 + 0.38	1	92	97
Telar + Escort + 2,4-D	0.028 + 0.035 + 0.38	1	88	98
Telar + Escort + 2,4-D	0.038 + 0.047 + 0.38	4	92	100
Telar + Escort + Transline	0.018 + 0.023 + 0.187	1	90	100
Telar + Escort + Transline	0.028 + 0.035 + 0.187	4	82	98
Telar + Escort + Transline	0.038 + 0.047 + 0.187	2	85	98
Telar + Escort + Transline	0.018 + 0.023 + 0.38	3	93	100
Telar + Escort + Transline	0.028 + 0.035 + 0.38	3	98	100
Telar + Escort + Transline	0.038 + 0.047 + 0.38	5	98	95
Transline	0.187	0	92	97
Transline	0.38	0	93	100
Weedy check			0	0
LSD 0.05		ns	13	5

[a]Grass injury ratings are the average of fall and spring applications.
[b]Cirar = Canada thistle.
[c]Fall and spring applications were made on 9-29-04 and 4-14-05, respectively.
[d]Fall and spring treatments were rated on 6-2-05.

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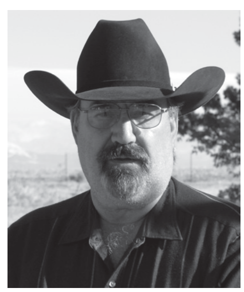

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