Pest Control in Crops Grown in Northwestern New Mexico, 2001

Annual Data Report 100-2001

Richard N. Arnold, Michael K. O'Neill, and Daniel Smeal[1]

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

Table of Contents **Page**

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).

[1]Respectively, College Professor, Department of Entomology, Plant Pathology and Weed Science; Associate Professor, Department of Plant and Environmental Sciences, Superintendent, Agricultural Science Center at Farmington; and College Professor, Department of Plant and Environmental Sciences, all of New Mexico State University.

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 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 (Raptor) 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 2001 on a Wall sandy loam (less than 1% organic matter) at Farmington 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 16. 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 9. A grab sample was taken from each treatment in one replication after harvest to determine protein content and relative feed value. Results obtained were subjected to analysis of variance at $P = 0.05$.

Results and discussion

Weed control and injury evaluations: Results of crop injury and weed control evaluations are given in Tables 1 and 2. All treatments except the check gave excellent control of annual broadleaf weeds. None of the herbicides caused any noticeable crop injury.

Yield and protein content: Results of yield, protein content, and relative feed values are given in Table 2. The weedy check had the highest yield of 3.5 t/ac. This is possibly attributed to the heavy weed pressure during harvest. Protein content ranged from 1.7 to 10.9 percent higher in the herbicide treated plots as compared to the check. Buctril and the weedy check had the lowest relative feed value of 123 and 112.

Broadleaf weed control in field corn with preemergence herbicides

Introduction

Weeds affect corn by competing for nutrients, light, 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, 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 2001 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 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 7. Treatments were applied on May 8 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 7 and July 10. 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 30 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. Axiom applied at 0.425 lb/ac had the highest injury rating of 63 and the lowest stand count of 19. All treatments except the check gave excellent control of annual broadleaf weeds (Table 3). In Table 4, Axiom applied at 0.425 lb/ac gave poor control of black nightshade.

Crop yields: Yields are given in Table 4. Yields were 60 to 187 bu/ac higher in herbicide treated plots as compared to the check.

Broadleaf weed control in field corn with preemergence and 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 2001 at Farmington to evaluate the response of field corn (var. Pioneer 34K77) 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 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 7. The preemergence treatments were applied on May 8 and immediately incorporated with 0.75 in. of sprinkler-applied water. Preemergence treatments were evaluated on June 6 and July 6. Sequential postemergence treatments were applied on June 12, when field corn was in the 4th leaf stage, and were evaluated on July 10. Postemergence treatments were applied on June 12, when field corn was in the 4th leaf stage and weeds were small, and were evaluated on July 10. Black nightshade and redroot and prostrate pigweed infestations were heavy and Russian thistle and common lambsquarters infestations were light throughout the experimental area. Preemergence, preemergence/sequential postemergence, and postemergence treatments were evaluated visually on June 6, July 6, and July 10. Crop injury was evaluated on June 6 and July 10. Stand counts were made on June 6 and July 10 by counting individual plants per 10 ft of the third row of each plot. Field corn was harvested on November 30 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. Stand counts are given in Table 5. Guardsman Max plus Hornet applied preemergence at 1.65 plus 0.15 lb/ac had the highest injury rating of 17 (Table 5). All treatments except the check gave good to excellent control of redroot and prostrate pigweed, black nightshade, and common lambsquarters (Tables 5 and 6). Outlook and Dual II Mag applied preemergence at 0.56 and 0.95 lb/ac gave poor control of Russian thistle. However, when the sequential postemergence treatments were applied, Russian thistle control increased significantly (Tables 5 and 6).

Crop yields: Yields are given in Table 6. Yields were 156 to 179 bu/ac higher in herbicide treated plots as compared to the check.

Broadleaf weed control in field corn with Outlook and Dual II preemergence and preemergence followed by sequential postemergence herbicides

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 2001 at Farmington to evaluate the response of field corn (var. Pioneer 34K77) 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 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 7. Preemergence treatments were applied on May 9 and immediately incorporated with 0.75 in. of sprinkler-applied water. Preemergence treatments were evaluated on June 7 and July 12. Sequential postemergence treatments were applied on June 12, when field corn was in the 4th leaf stage, and were evaluated on July 12. Black nightshade and redroot and prostrate pigweed infestations were heavy and Russian thistle and common lambsquarters infestations were light throughout the experimental area. Field corn was harvested on November 30 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 7 and 8. Stand counts are given in Table 7. All treatments except the check gave good to excellent control of redroot and prostrate pigweed, black nightshade, and common lambsquarters (Tables 7 and 8). Dual II Mag and Outlook applied preemergence at 0.95 and 0.56 lb/ac and followed by sequential postemergence treatments of Callisto or AAtrex at 0.094 and 0.25 lb/ac gave poor control of Russian thistle.

Crop yields: Yields are given in Table 8. Yields were 132 to 167 bu/ac higher in the herbicide treated plots as compared to the check.

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, they 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 to 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 2001 at Farmington to evaluate the response of field corn (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 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 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 5, 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 10 and August 10. 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 30 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. All treatments except the check gave excellent control of redroot and prostrate pigweed. Black nightshade, Russian thistle, and common lambsquarters control with Steadfast or DPX 79406 applied alone at 0.035 or 0.023 lb/ac, respectively, was poor (Tables 9 and 10). None of the herbicides caused any noticeable crop injury (Table 9).

Crop yields: Yields are given in Table 10. Yields were 146 to 162 bu/ac higher in herbicide treated plots as compared to the check.

Broadleaf weed control in Roundup Ready field corn with postemergence herbicides

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 2001 at Farmington to evaluate the response of Roundup Ready field corn (var. Dekalb 551RR) 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 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 7. Postemergence treatments were applied on June 5, when corn was in the 4th leaf stage leaf and weeds were small. Common lambsquarters, redroot and prostrate pigweed, and black nightshade infestations were heavy and Russian thistle infestations were light throughout the experimental area. Weed control evaluations were made on July 10 and August 10. Crop injury evaluations were made on July 10. Stand counts were made on July 10 by counting individual plants per 10 ft of the third row of each plot. Field corn was harvested on November 30 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 11 and 12. Stand counts are given in Table 11. In Table 11, none of the herbicides caused any noticeable crop injury. In Tables 11 and 12, Beacon applied at 0.036 lb/ac gave poor control of common lambsquarters. Redroot and prostrate pigweed, black nightshade, and Russian thistle control were poor with Hornet and Aim applied at 0.171 and 0.008 lb/ac (Tables 11 and 12).

Crop yields: Yields are given in Table 12. Yields were 127 to 172 bu/ac higher in the herbicide treated plots as compared to the check.

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 and Raptor 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 2001 at Farmington to evaluate the response of dry edible beans (var. Montrose) 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 31 and rototilled in at a depth of 3 in. Preemergence treatments were applied on May 31 and immediately incorporated with 0.75 in. of sprinkler-applied water. Postemergence applications of Pursuit plus Basagran were banded over the top of dry beans after cultivation at the 3rd trifoliate leaf stage on June 25. Soils were fertilized according to New Mexico State University recommendations based on soil tests. Individual plots were four 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 31. 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 26. Dry beans were cut and left in the field one week before thrashing. Dry beans were harvested on August 23 by combining the two center rows of each plot.

Results and discussion

Weed control evaluations: Weed control evaluations are given in Table 13. 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. Also, Pursuit plus Basagran with COC increased broadleaf weed control over Dual II Mag or Frontier used alone.

Crop yields: Yields are given in Table 14. Yields were 2,120 to 2,285 lbs/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 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.

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 2001 at Farmington to evaluate the response of sunflowers (NK 278) and annual broadleaf weeds to preemergence applications of Frontier, Dual II Mag, and Spartan applied alone or in combination with Dual II Mag. Sunflowers were planted on May 23 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 360 ft long. Preemergence applications were applied on May 24 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 26 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 and injury evaluations: Weed control evaluations are given in Tables 15 and 16. Spartan applied preemergence at 0.094 lb/ac gave poor control of Russian thistle. All treatments gave good to excellent control of redroot and prostrate pigweed and common lambsquarters.

Crop yields: Yields are given in Table 16. Yields were 1,695 to 2,955 lb/ac higher in the herbicide treated plots as compared to the check.

Russian knapweed 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, New Mexico and Southwestern Colorado.

Objectives

- To determine efficacy of selected herbicides for control of Russian knapweed in Montezuma County, Colorado.

Materials and Methods

A field experiment was conducted in 2001 in Montezuma County, Colorado, at two locations to evaluate the response of Russian knapweed 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 September 13, 2000, when Russian knapweed was in the pre-bloom to bloom stage. All treatments were applied with a COC at 1% v/v. Treatments were rated approximately one year after treatment on September 19, 2001.

Results and Discussion

Weed control evaluations: Weed control evaluations for the Cortez Drive-in and Lively's ranch are given in Tables 17 and 18. Tordon 101 and Transline applied postemergence at 1.27 and 2.54 and 0.25 and 0.5 lb/ac, respectively, gave good to excellent control of Russian knapweed at both locations (Tables 17 and 18).

Table 1. Control of Annual Broadleaf Weeds with Postemergence Applications of Raptor and Pursuit Applied Alone or in Combination in Spring-Seeded Alfalfa, July 12, 2001; at Farmington, NM

		Crop	Weed Control[b,c]				
	Rate	Injury[b]	Saskr	Amare	Amabl	Solni	Cheal
Treatments[a]	(lb/ac)	(%)	(%)				
Raptor	0.032	0	100	100	100	100	100
Raptor	0.047	0	100	100	100	100	100
Raptor + Buctril	0.032 + 0.25	0	100	98	100	98	100
Raptor + Buctril	0.04 + 0.25	0	100	98	100	100	100
Raptor + Buctril	0.047 + 0.25	0	100	96	100	100	100
Raptor + 2,4-DB	0.032 + 0.5	0	100	100	100	100	100
Raptor + 2,4-DB	0.047 + 0.5	0	100	100	100	100	100
Raptor + 2,4-DB	0.04 + 0.5	0	97	100	100	100	100
Pursuit + Buctril	0.063 + 0.25	0	100	97	100	100	100
Pursuit + 2,4-DB	0.063 + 0.5	0	100	98	100	100	100
Pursuit	0.063	0	100	100	100	100	98
Raptor + Select	0.032 + 0.094	0	100	100	100	100	100
Raptor + Select	0.04 + 0.094	0	100	100	100	100	100
Pursuit + Select	0.063 + 0.094	0	100	98	100	100	100
Buctril + Select	0.25 + 0.094	0	100	10	10	10	98
Weedy check		0	0	0	0	0	0
LSD 0.05		ns	1	4	2	2	2

[a]Treatments applied with COC at 1% v/v and AMS at 5 lb/ac.
[b]Based on visual scale from 0 to 100, where 0 = no control or crop injury and 100 = dead plants.
[c]Saskr = Russian thistle, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Cheal = common lambsquarters.

Table 2. Yield of Legend Alfalfa Sprayed with Postemergence Applications of Raptor and Pursuit Applied Alone or in Combination in Spring-Seeded Alfalfa, August 9, 2001; at Farmington, NM

	Rate	Yield	RFV[b]	Protein Content
Treatments[a]	(lb/ac)	t/ac	(no.)	(%)
Raptor	0.032	2.1	165	21.5
Raptor	0.047	2.1	160	21.2
Raptor + Buctril	0.032 + 0.25	2.2	148	21.6
Raptor + Buctril	0.04 + 0.25	2.0	156	22.5
Raptor + Buctril	0.047 + 0.25	2.2	147	22.2
Raptor + 2,4-DB	0.032 + 0.5	2.2	152	22.3
Raptor + 2,4-DB	0.047 + 0.5	2.0	160	21.4
Raptor + 2,4-DB	0.04 + 0.5	2.2	142	21.9
Pursuit + Buctril	0.063 + 0.25	2.1	147	22.0
Pursuit + 2,4-DB	0.063 + 0.5	2.2	143	21.6
Pursuit	0.063	2.1	165	21.7
Raptor + Select	0.032 + 0.094	2.1	146	22.5
Raptor + Select	0.04 + 0.094	2.3	149	22.5
Pursuit + Select	0.063 + 0.094	2.0	142	21.9
Buctril + Select	0.25 + 0.094	3.1	123	13.3
Weedy check		3.5	112	11.6
LSD 0.05		0.7		

[a]Treatments applied with a COC at 1% v/v and AMS at 5 lb/ac.
[b]RFV = relative feed value.

Table 3. Control of Annual Broadleaf Weeds with Preemergence Herbicides in Field Corn on June 7, 2001; at Farmington, NM

Treatments[a]	Rate (lb/ac)	Crop Injury[b] (%)	Stand Count (no.)	Weed Control[b,c] Cheal (%)	Amare (%)	Amabl (%)	Solni (%)	Saskr (%)
Callisto	0.147	0	24	100	100	100	100	100
USA 2001	0.29	0	24	100	100	100	100	100
USA 2001 + AAtrex	0.29 + 0.66	0	24	100	100	100	100	100
USA 2001	0.36	0	24	100	100	100	100	100
USA 2001 + AAtrex	0.36 + 0.66	0	24	100	100	100	100	100
USA 2001	0.45	0	4	100	100	100	100	100
USA 2001 + AAtrex	0.45 + 0.66	0	24	100	100	100	100	100
Flufenacet + AAtrex	0.45 + 0.66	0	24	100	100	100	100	100
Axiom (pm) + AAtrex	0.17 + 0.66	0	24	100	100	100	100	100
Axiom (pm)	0.425	63	19	100	100	100	100	100
Bicep Lite II Mag (pm)	2.25	0	24	100	100	100	100	100
USA 2001	0.54	0	24	100	100	100	100	100
Callisto + Topnotch	0.147 + 1.62	0	25	100	100	100	100	100
Axiom (pm) + AAtrex	0.26 + 0.66	9	24	100	100	100	100	100
Guardsman	2.3	6	24	100	100	100	100	100
Weedy check		0	25	0	0	0	0	0
LSD 0.05		4	2	1	1	1	1	1

[a]pm = packaged mix.
[b]Based on a visual scale from 0 to 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 4. Control of Annual Broadleaf Weeds with Preemergence Herbicides in Field Corn on July 10, 2001; at Farmington, NM

Treatments[a]	Rate (lb/ac)	Weed Control[b,c] Cheal (%)	Amare (%)	Amabl (%)	Solni (%)	Saskr (%)	Yield (bu/ac)
Callisto	0.147	100	98	99	99	98	223
USA 2001	0.29	100	100	100	100	100	232
USA 2001 + AAtrex	0.29 + 0.66	100	100	100	100	100	241
USA 2001	0.36	100	100	100	100	100	229
USA 2001 + AAtrex	0.36 + 0.66	100	100	100	100	100	238
USA 2001	0.45	100	100	100	100	100	224
USA 2001 + AAtrex	0.45 + 0.66	100	100	100	100	100	232
Flufenacet + AAtrex	0.45 + 0.66	100	100	100	100	100	224
Axiom (pm) + AAtrex	0.17 + 0.66	100	100	100	100	100	233
Axiom (pm)	0.425	100	100	100	45	100	114
Bicep Lite II Mag (pm)	2.25	100	100	100	100	100	239
USA 2001	0.54	100	100	100	100	100	227
Callisto + Topnotch	0.147 + 1.62	100	100	100	100	100	236
Axiom (pm) + AAtrex	0.26 + 0.66	100	100	100	100	100	208
Guardsman	2.3	100	100	100	100	100	228
Weedy check		0	0	0	0	0	54
LSD 0.05		1	1	1	3	1	41

[a]pm = packaged mix.
[b]Based on a visual scale from 0 to 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 5. Control of Annual Broadleaf Weeds with Preemergence Herbicides Followed by Sequential Postemergence Herbicides in Field Corn on June 6, 2001; at Farmington, NM

Treatments[a]	Rate (lb/ac)	Crop Injury[g] (%)	Stand Count (no.)	Weed Control[g,h] (%)				
				Amare	Amabl	Solni	Cheal	Saskr
Bicept Lite II Mag[b] (pm)	1.65	0	24	100	100	100	100	100
Bicep II Mag[b] (pm)	2.1	2	24	100	100	100	100	100
Guardsman Max[b] (pm)	1.65	9	23	100	100	100	100	100
Guardsman Max (pm) + Hornet[b] (pm)	1.65 + 0.15	17	24	100	100	100	100	100
Bicep Lite II Mag (pm) + Hornet[b] (pm)	1.65 + 0.15	11	24	100	100	100	100	100
Bicep II Mag (pm) + Hornet[b] (pm)	2.1 + 0.15	9	24	100	100	100	100	100
Outlook/Marksman[c,d] (pm)	0.56/0.8	0	24	100	100	98	97	46
Outlook/Hornet (pm) + Clarity[c,e]	0.56/0.15 + 0.13	3	24	100	100	97	97	48
Outlook/Hornet (pm) + AAtrex[c,f]	0.56/0.15 + 1.0	0	24	100	100	98	98	50
Guardsman Max (pm)/Hornet[c,e] (pm)	1.65/0.15	8	24	00	100	100	100	100
Dual II Mag/Hornet (pm) + Clarity[c,e]	0.95/0.15 + 0.13	0	24	100	100	96	198	48
Dual II Mag/Hornet (pm) + AAtrex[c,f]	0.95/0.15 + 1.0	0	25	100	100	97	98	48
Bicep Lite II Mag (pm)/Hornet[c,e]	1.65/0.15	0	24	100	100	100	100	100
Weedy check		0	24	0	0	0	0	0
LSD 0.05		2	ns	1	1	2	2	6

[a]pm = packaged mix.
[b]Treatments applied preemergence and rated on June 6.
[c]First treatment applied preemergence followed by a sequential postemergence treatment.
[d]Sequential postemergence treatments applied June 12 with 32-0-0 at 2% v/v.
[e]Sequential postemergence treatments applied June 12 with NIS at 0.25% v/v.
[f]Sequential postemergence treatments applied June 12 with COC at 1% v/v.
[g]Based on a visual scale from 0 to 100, where 0 = no control or crop injury and 100 = dead plants.
[h]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 6. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence Herbicides in Field Corn on July 10, 2001; at Farmington, NM

Treatments[a]	Rate (lb/ac)	Weed Control[h,i] Amare	Amabl	Solni	Cheal	Saskr	Yield (bu/ac)
		(%)					
Bicep Lite II Mag[b] (pm)	1.65	100	100	100	100	100	230
Bicep II Mag[b] (pm)	2.1	100	100	98	100	100	243
Guardsman Max[b] (pm)	1.65	97	100	97	100	100	247
Guardsman Max (pm) + Hornet[b] (pm)	1.65 + 0.15	99	100	100	100	100	221
Bicep Lite II Mag (pm) + Hornet[b] (pm)	1.65 + 0.15	99	100	95	100	100	235
Bicep II Mag (pm) + Hornet[b] (pm)	2.1 + 0.15	100	100	100	100	100	233
Outlook/Marksman[c,d] (pm)	0.56/0.8	99	100	99	100	100	232
Outlook/Hornet (pm) + Clarity[c,e]	0.56/0.15 + 0.13	100	100	96	100	97	233
Outlook/Hornet (pm) + AAtrex[c,f]	0.56/0.15 + 1.0	100	100	99	100	99	225
Guardsman Max (pm)/Hornet[c,e] (pm)	1.65/0.15	99	100	100	100	100	231
Dual II Mag/Hornet (pm) + Clarity[c,e]	0.95/0.15 + 0.13	99	100	100	100	97	235
Dual II Mag/Hornet (pm) + AAtrex[c,f]	0.95/0.15 + 1.0	99	100	100	100	97	239
Bicep Lite II Mag (pm)/Hornet[c,e]	1.65/0.15	100	100	100	100	100	224
Bicept Lite II Mag (pm) + Hornet (pm) + Clarity[g]	1.65 + 0.15 + 0.06	95	98	91	100	90	237
Guardsman Max (pm) + Hornet (pm) + Clarity[g]	1.65 + 0.15 + 0.06	98	98	98	100	96	229
Weedy check		0	0	0	0	0	68
LSD 0.05		2	1	3	1	2	38

[a]pm = packaged mix.
[b]Treatments applied preemergence and rated on July 6.
[c]First treatment applied preemergence followed by a sequential postemergence treatment.
[d]Sequential postemergence treatment applied June 12 with 32-0-0 at 2% v/v and rated on July 10.
[e]Sequential postemergence treatments applied June 12 with NIS at 0.25% v/v and rated on July 10.
[f]Sequential postemergence treatments applied June 12 with COC at 1% v/v and rated on July 10.
[g]Treatments applied postemergence and rated on July 10. Treatments showed no sign of crop injury and had an average stand count of 24.
[h]Based on a visual scale from 0 to 100, where 0 = no control or crop injury and 100 = dead plants.
[i]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 7. Control of Annual Broadleaf Weeds with Preemergence Herbicides Followed by Sequential Postemergence Herbicides in Field Corn on June 7, 2001; at Farmington, NM

Treatments[a]	Rate (lb/ac)	Crop Injury[f] (%)	Stand Count (no.)	Weed Control[f,g] (%)				
				Amare	Amabl	Solni	Cheal	Saskr
Outlook + Prowl + Callisto[b]	0.56 + 0.19	0	24	100	100	100	100	100
Outlook + Prowl + Balance Pro[b]	0.56 + 1.0 + 0.035	0	25	100	100	100	100	100
Dual II Mag + Callisto[b]	0.95 + 0.19	0	24	100	100	100	100	100
Dual II Mag + Callisto + AAtrex[b]	0.95 + 0.19 + 0.5	0	25	100	100	100	100	100
Outlook + Callisto[b]	0.56 + 0.19	0	24	100	100	100	100	100
Outlook + Callisto + AAtrex[b]	0.56 + 0.19 + 0.5	0	25	100	100	100	100	100
Guardsman Max (pm) + Balance Pro[b]	1.65 + 0.035	0	25	100	100	100	100	100
Outlook + Balance Pro[b]	0.56 + 0.035	0	25	100	100	100	100	100
Dual II Mag/Callisto[c,d]	0.95/0.094	0	24	100	100	96	100	45
Dual II Mag/Callisto + AAtrex[c,d]	0.095/0.094 + 0.25	0	25	100	100	97	100	43
Outlook/Callisto + AAtrex[c,d]	0.56/0.094 + 0.25	0	24	100	100	98	100	61
Guardsman Max (pm)/ Distinct[c,e]	1.65/0.18	0	24	100	100	100	100	100
Outlook/Marksman (pm)[c,e]	0.56/0.8	0	24	100	100	97	100	66
Outlook/Callisto[c,d]	0.56/0.094	0	24	100	100	98	100	65
Outlook + Prowl/Callisto[c,d]	0.56 + 1.0/0.094		24	100	100	100	100	100
Weedy check		0	24	0	0	0	0	0
LSD 0.05			ns	1	1	2	2	7

[a]pm = packaged mix.
[b]Treatments applied preemergence and rated on June 7.
[c]First treatment applied preemergence and rated on June 7, followed by a sequential postemergence treatment.
[d]Sequential postemergence treatments applied with COC at 1% v/v.
[e]Sequential postemergence treatments applied with 32-0-0 at 2% v/v.
[f]Based on a visual scale from 0 to 100, where 0 = no control or crop injury and 100 = dead plants.
[g]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 8. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence Herbicides in Field Corn on July 12, 2001; at Farmington, NM

		Weed Control[f,g]					
Treatments[a]	Rate (lb/ac)	Amare	Amabl	Solni	Cheal	Saskr	Yield (bu/ac)
		(%)					
Outlook + Prowl + Callisto[b]	0.56 + 0.19	100	100	100	100	100	206
Outlook + Prowl + Balance Pro[b]	0.56 + 1.0 + 0.035	100	100	99	100	100	209
Dual II Mag + Callisto[b]	0.95 + 0.19	100	100	100	100	100	209
Dual II Mag + Callisto + AAtrex[b]	0.95 + 0.19 + 0.5	100	100	100	100	100	214
Outlook + Callisto[b]	0.56 + 0.19	100	100	100	100	100	211
Outlook + Callisto + AAtrex[b]	0.56 + 0.19 + 0.5	100	100	100	100	100	214
Guardsman Max (pm) + Balance Pro[b]	1.65 + 0.035	100	100	100	100	100	198
Outlook + Balance Pro[b]	0.56 + 0.035	100	100	100	100	100	208
Dual II Mag/Callisto[c,d]	0.95/0.094	100	100	100	100	48	206
Dual II Mag/Callisto + AAtrex[c,d]	0.095/0.094 + 0.25	100	100	100	100	57	215
Outlook/Callisto + AAtrex[c,d]	0.56/0.094 + 0.25	100	100	100	100	60	222
Guardsman Max (pm)/ Distinct[c,e]	1.65/0.18	100	100	100	100	100	206
Outlook/Marksman (pm)[c,e]	0.56/0.8	100	100	100	100	100	188
Outlook/Callisto[c,d]	0.56/0.094	100	100	100	100	53	223
Outlook + Prowl/Callisto[c,d]	0.56 + 1.0/0.094	100	100	100	100	50	203
Weedy check		0	0	0	0	0	56
LSD 0.05		1	1	1	1	5	32

[a]pm = packaged mix.
[b]First treatment applied preemergence and rated on July 12.
[c]First treatment applied preemergence followed by a sequential postemergence treatment and rated on July 12.
[d]Sequential postemergence treatments applied with COC at 1% v/v and rated on July 12.
[e]Sequential postemergence treatments applied with 32-0-0 at 2% v/v and rated on July 12.
[f]Based on a visual scale from 0 to 100, where 0 = no control or crop injury and 100 = dead plants.
[g]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 9. Control of Annual Broadleaf Weeds with Postemergence Herbicides in Field Corn on July 10, 2001; at Farmington, NM

	Crop Rate	Stand Injury[b]	Count	Weed Control[b,c]				
Treatments[a]	(lb/ac)	(%)	(no.)	Amare	Amabl	Solni	Saskr	Cheal
				(%)				
Steadfast (pm)	0.035	0	25	100	100	43	56	72
Steadfast (pm) + Clarity	0.035 + 0.125	0	24	100	100	96	100	100
Steadfast (pm) + Marksman (pm)	0.035 + 0.4	0	25	100	100	99	99	100
Steadfast (pm) + AAtrex	0.035 + 0.45	0	24	100	100	100	80	100
Steadfast (pm) + Distinct (pm)	0.035 + 0.08	0	24	100	100	65	99	100
Steadfast (pm) + Tough	0.035 + 0.47	0	24	100	100	47	100	100
Steadfast (pm) + Callisto	0.035 + 0.063	0	25	100	100	100	68	100
DPX 79406	0.023	0	24	100	100	36	56	28
DPX 79406 + Clarity	0.023 + 0.125	0	24	100	100	96	100	100
DPX 79406 + Marksman (pm)	0.023 + 0.4	0	24	100	100	98	98	100
DPX 79406 + AAtrex	0.023 + 0.45	0	24	100	100	99	73	100
DPX 79406 + Distinct (pm)	0.023 + 0.08	0	24	100	100	96	100	100
DPX 79406 + Tough	0.023 + 0.47	0	25	100	100	43	99	30
DPX 79406 + Callisto	0.023 + 0.063	0	25	100	100	100	47	100
AAtrex[d]	1.5	0	24	100	100	98	99	100
Weedy check		0	24	0	0	0	0	0
LSD 0.05		1	ns	1	1	9	7	3

[a]All treatments were applied with 32-0-0 and MSO at 2 and 1% v/v, respectively, and pm = packaged mix.
[b]Based on a visual scale from 0 to 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 preemergence and rated on June 6.

Table 10. Control of Annual Broadleaf Weeds with Postemergence Herbicides in Field Corn on August 10, 2001; at Farmington, NM

Treatments[a]	Rate (lb/ac)	Weed Control[b,c] Amare	Amabl	Solni	Saskr	Cheal	Yield (bu/ac)
		(%)					
Steadfast (pm)	0.035	100	100	40	50	70	229
Steadfast (pm) + Clarity	0.035 + 0.125	100	100	94	100	100	229
Steadfast (pm) + Marksman (pm)	0.035 + 0.4	100	100	98	98	100	229
Steadfast (pm) + AAtrex	0.035 + 0.45	100	100	99	77	100	236
Steadfast (pm) + Distinct (pm)	0.035 + 0.08	100	100	55	98	100	237
Steadfast (pm) + Tough	0.035 + 0.47	100	100	43	97	100	232
Steadfast (pm) + Callisto	0.035 + 0.063	100	100	100	65	100	233
DPX 79406	0.023	100	100	36	53	22	225
DPX 79406 + Clarity	0.023 + 0.125	100	100	93	100	99	229
DPX 79406 + Marksman (pm)	0.023 + 0.4	100	100	97	98	100	235
DPX 79406 + AAtrex	0.023 + 0.45	100	100	98	70	100	232
DPX 79406 + Distinct (pm)	0.023 + 0.08	100	100	94	99	100	231
DPX 79406 + Tough	0.023 + 0.47	100	100	43	98	27	226
DPX 79406 + Callisto	0.023 + 0.063	100	100	99	43	100	235
AAtrex[d]	1.5	100	100	97	98	100	241
Weedy check		0	0	0	0	0	79
LSD 0.05		1	1	8	7	4	38

[a]All treatments were applied with 32-0-0 and MSO at 2 and 1% v/v, respectively, and pm = packaged mix.
[b]Based on a visual scale from 0 to 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 preemergence and evaluated on July 6.

Table 11. Control of Annual Broadleaf Weeds in Roundup Ready Field Corn with Postemergence Herbicides on July 10, 2001; at Farmington, NM

Treatments[a]	Rate (lb/ac)	Crop Injury[c] (%)	Stand Count (no.)	Weed Control[c,d] Cheal	Amare	Amabl	Solni	Saskr
				(%)				
Mon 12075	0.168	0	25	100	86	78	94	88
Callisto	0.094	0	24	100	43	53	98	90
Beacon	0.036	0	25	13	9	98	46	95
Hornet (pm)	0.171	0	24	100	13	23	40	47
Celebrity Plus (pm)	0.206	0	24	100	98	100	100	98
Aim	0.008	0	25	100	13	27	43	57
Basis Gold[a] (pm)	0.78	0	24	100	96	100	100	98
Distinct	0.262	0	24	100	99	100	100	100
Exceed (pm)	0.036	0	24	100	30	53	57	92
Northstar (pm)	0.161	0	25	100	100	100	100	99
Marksman (pm)	1.4	0	24	100	100	100	100	99
Mon 12075[b]	0.168	0	24	100	94	95	100	100
Permit + Banvel	0.031 + 0.13	0	24	100	83	97	100	100
Callisto + Accent	0.094 + 0.032	0	24	100	97	97	100	98
Permit + Clarity	0.031 + 0.13	0	24	100	97	98	100	100
Weedy check		0	24	0	0	0	0	0
LSD 0.05			ns	4	10	8	6	6

[a]Treatment was applied with a COC and 32-0-0 at 1 and 2% v/v, respectively.
[b]Treatment was applied with NIS at 0.25% v/v, and all other treatments had an NIS and 32-0-0 added at 0.25 and 2.0% v/v, respectively.
[c]Based on a visual scale from 0 to 100, where 0 = no control or crop injury and 100 = dead plants.
[d]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Saskr = Russian thistle.

Table 12. Control of Annual Broadleaf Weeds in Roundup Ready Field Corn with Postemergence Herbicides on August 10, 2001; at Farmington, NM

		Weed Control[c,d]					
Treatments[a]	Rate (lb/ac)	Cheal	Amare	Amabl	Solni	Saskr	Yield (bu/ac)
		(%)					
Mon 12075	0.168	100	84	77	93	88	206
Callisto	0.094	100	40	0	97	89	202
Beacon	0.036	13	99	97	47	93	220
Hornet (pm)	0.171	100	10	13	37	40	189
Celebrity Plus (pm)	0.206	100	99	99	98	98	208
Aim	0.008	100	10	17	37	53	185
Basis Gold[a] (pm)	0.78	100	94	99	100	98	220
Distinct	0.262	100	99	100	99	100	204
Exceed (pm)	0.036	100	23	47	50	90	188
Northstar (pm)	0.161	100	100	99	99	98	207
Marksman (pm)	1.4	100	100	99	98	99	213
Mon 12075[b]	0.168	100	92	92	98	99	225
Permit + Banvel	0.031 + 0.13	100	82	96	99	100	189
Callisto + Accent	0.094 + 0.032	100	98	96	99	97	230
Permit + Clarity	0.031 + 0.13	100	97	98	99	100	200
Weedy check		0	0	0	0	0	58
LSD 0.05		4	8	9	9	5	34

[a]Treatment was applied with a COC and 32-0-0 at 1 and 2% v/v, respectively.
[b]Treatment was applied with NIS at 0.25% v/v, and all other treatments had an NIS and 32-0-0 added at 0.25 and 2% v/v, respectively.
[c]Based on a visual scale from 0 to 100, where 0 = no control or crop injury and 100 = dead plants.
[d]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Saskr = Russian thistle.

Table 13. 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 and July 26, 2001; at Farmington, NM

		Weed Control[a,b]				
Treatments	Rate (lb/ac)	Cheal	Amare	Amabl	Solni	Saskr
		(%)				
Sonalan + Dual II Mag[c]/Pursuit + Basagran[e]	0.94 + 1.25/ 0.023 + 0.5	100	100	100	100	100
Sonalan + Frontier[c]/Pursuit + Basagran[e]	0.94 + 1.0/ 0.032 + 0.5	100	100	100	100	100
Dual II Mag[d]/Pursuit + Basagran[e]	1.25/0.032 + 0.5	65	97	98	72	40
Frontier[d]/Pursuit + Basagran[e]	1.0/ 0.032 + 0.5	76	97	95	83	50
Weedy check		0	0	0	0	0

[a]Based on a visual scale from 0 to 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 and rated on June 26.
[d]Treatments applied preemergence and rated on June 26.
[e]Treatments applied postemergence after cultivation as a band on June 25 with COC and 32-0-0 applied at 1 and 2% v/v, respectively, and rated on July 26.

Table 14. 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 and July 26, 2001; at Farmington, NM

		Weed Control[a,b]					Montrose
	Rate	Cheal	Amare	Amabl	Solni	Saskr	Yield
Treatments	(lb/ac)	(%)					(lb/ac)
Sonalan + Dual II Mag[c]/ Pursuit + Basagran[e]	0.94 + 1.25/ 0.023 + 0.5	100	100	100	100	100	2,950
Sonalan + Frontier[c]/Pursuit + Basagran[e]	0.94 + 1.0/ 0.032 + 0.5	100	100	100	100	100	2,895
Dual II Mag[d]/Pursuit + Basagran[e]	1.25/0.032 + 0.5	97	100	100	92	78	2,845
Frontier[d]/Pursuit + Basagran[e]	1.0/ 0.032 + 0.5	98	100	100	96	85	2,925
Weedy check		0	0	0	0	0	725

[a]Based on a visual scale from 0 to 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 and rated on June 26.
[d]Treatments applied preemergence and rated on June 26.
[e]Treatments applied postemergence after cultivation as a band on June 25 with COC and 32-0-0 applied at 1 and 2% v/v, respectively, and rated on July 26.

Table 15. Control of Annual Broadleaf Weeds in Sunflowers with Preemergence Applications of Frontier, Dual II Mag, and Spartan Applied Alone or in Combination with Dual II Mag, June 28, 2001

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

[a]Based on a scale from 0 to 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 16. Control of Annual Broadleaf Weeds in Sunflowers with Preemergence Applications of Frontier, Dual II Mag, and Spartan Applied Alone or in Combination with Dual II Mag, July 28, 2001

		Weed control[a,b]					
	Rate	Amare	Amabl	Solni	Cheal	Saskr	Yield
Treatments	(lb/ac)	(%)					(lb/ac)
Frontier	1.0	90	90	88	94	76	4,100
Dual II Mag	1.25	93	90	75	96	70	3,845
Spartan	0.094	92	90	70	85	30	2,950
Dual II Mag + Spartan	1.0 + 0.094	98	96	96	96	72	4,210
Check	0	0	0	0	0	0	1,255

[a]Based on a visual scale from 0 to 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 17. Control of Russian Knapweed at the Cortez Drive-In with Selected Herbicides Applied Postemergence on September 13, 2000, and Rated Approximately One Year After Treatment on September 19, 2001

Treatments[a]	Rate (lb/ac)	Weed Control Cenre[b] (%)
Tordon 101	1.27	86
Tordon 101	2.54	99
Transline	0.25	91
Transline	0.50	99
Remedy	0.65	5
Remedy	1.25	1
Crossbow	1.50	1
Crossbow	3.00	22
Curtail	1.20	52
Curtail	2.40	89
Banvel	2.00	65
Weedy check	0.00	0
LSD 0.05		14

[a]Treatments applied postemergence on September 13, 2000.
[b]Cenre = Russian knapweed and rated approximately one year after treatment on September 19, 2001.

Table 18. Control of Russian Knapweed at Lively's Ranch with Selected Herbicides Applied Postemergence on September 13, 2000, and Rated Approximately One Year After Treatment on September 19, 2001

Treatments[a]	Rate (lb/ac)	Weed Control Cenre[b] (%)
Tordon 101	1.27	96
Tordon 101	2.54	100
Transline	0.25	95
Transline	0.50	100
Remedy	0.65	28
Remedy	1.25	43
Crossbow	1.50	23
Crossbow	3.00	48
Curtail	1.20	98
Curtail	2.40	97
Banvel	2.00	63
Weedy check	0.00	0
LSD 0.05		57

[a]Treatments applied postemergence on September 13, 2000.
[b]Cenre = Russian knapweed and rated approximately one year after treatment on September 19, 2001.

REFERENCES

Arnold, R.N. 1981–2008. *Annual weeds industry research report*. Farmington: New Mexico State University Agricultural Science Center, New Mexico State University Agricultural Experiment Station.

Chandler, J.M., A.S. Hamill, and A.G. Thomas. 1984. *Crop losses due to weeds in Canada and the United States: Special report of the Losses Due to Weeds Committee.* Champaign, IL: Weed Science Society of America.

Currie, R.S. 2004. Comparisons of 40 herbicide tank mixes for weed control in Round-up ready corn. In *Field Day 2004, Southwest Research-Extension Center, Report of Progress 927* (pp. 34–36). Manhattan, KS: Kansas Agricultural Experiment Station, Kansas State University.

Currie, R.S. 2005. Comparison of 33 herbicide tank mixes for weed control in glyphosate resistant corn. In Field *Day 2005, Southwest Research-Extension Center, Report of Progress 945* (pp. 31–33). Manhattan, KS: Kansas Agricultural Experiment Station, Kansas State University.

Lorenzi, H.J., and L.S. Jeffery. 1987. *Weeds of the United States and their control.* New York: Van Nostrand Reinhold Co., Inc.

Massinga, R.A., R.S. Currie, and T.P. Trooien. 1999. Effect of Palmer amaranth density on corn water use efficiency. *Proceedings of the North Central Weed Science Society, 54*, 43.

Massinga, R.A., R.S. Currie, and T.P. Trooien. 2003. Water use and light interception under Palmer amaranth (*Amaranthus palmeri)* and corn competition. *Weed Science, 51*, 523–531.

NOTICE TO USERS OF THIS REPORT

This report has been prepared as an aid to the Agricultural Science Center staff for analyzing the results of various research during the past year and for recording pertinent data for future reference. This is not a formal Agricultural Experiment Station report of research results.

Information in this report represents results from only one year's research. The reader is cautioned against drawing conclusions or making recommendations as a result of data in the report. In many instances, data in this report represent only one of several years of research results that will constitute the final formal report. It should be pointed out, however, that staff members have made every effort to check the accuracy of the data presented.

This report is not intended as a formal release; therefore, none of the data or information herein is authorized for release or publication without the written approval of the New Mexico Agricultural Experiment Station.

Brand names appearing in publications are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned. Persons using such products assume responsibility for their use in accordance with current label directions of the manufacturer. Mention of a proprietary pesticide does not imply registration under FIFRA as amended.