Pest Control in Crops Grown in Northwestern New Mexico, 2008

Annual Data Report 100-2008

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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

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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.

BASF, 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. Field trials were conducted to evaluate broadleaf weed control to Raptor alone or in combination.

Objectives

- Determine efficacy of Raptor alone or in combination applied to spring-seeded alfalfa.
- Determine alfalfa tolerance to applied selected herbicides and alfalfa yield.

Materials and methods

A field experiment was conducted in 2008 on a Wall sandy loam (less than 1% organic matter) soil at Farmington, NM, to evaluate the response of spring-seeded alfalfa and annual broadleaf weeds to postemergence applications of Raptor 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. WL 343HQ) was planted at 20 lb/ac with a Massey Ferguson grain drill on May 15. Postemergence treatments were applied on June 24 when alfalfa was in the 3rd to 4th trifoliolate leaf stage and weeds were small (<3–4 in.). The maximum and minimum air temperatures during treatment application were 91°F and 62°F, respectively. A total of approximately 30 in. of sprinkler-applied water were applied to all treatments form May 15 to August 5. 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 24. Alfalfa was harvested with an Almaco self-propelled plot harvester on August 5. A grab sample was taken from each plot 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 Table 1. No crop injury was noted from any of the treatments. All treatments gave good to excellent control of Russian thistle, redroot and prostrate pigweed, and black nightshade. Raptor applied alone at 0.032 lb ai/ac gave poor control of common lambsquarters (Table 1).

Yield and protein content: Results of yield are given in Table 1. With the heavy broadleaf weed infestation, the weedy check had the highest yield of 3.7 t/ac.

BASF, 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 incorporate one or two herbicides in combination preplant, 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 of applied selected herbicides.
- Determine dry bean tolerance to applied selected herbicides and dry bean yield.

Materials and methods

A field experiment was conducted in 2008 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 based on soil tests by New Mexico State University. 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 35 psi. Dry beans were planted with flexi-planters on May 27. Preemergence treatments were applied on May 29 and immediately incorporated with 0.75 in. of sprinkler-applied water. Sequential postemergence treatments were applied on July 1 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. Air temperature ranges during preemergence and postemergence applications were 86 to 44°F and 88 to 54°F, respectively. A total of approximately 30 in. of water were applied with a sprinkler to all plots during the growing season. Crop injury and weed control evaluations were made on June 30 and July 31. Preemergence followed by sequential postemergence treatments were evaluated on July 31. Dry beans were hand harvested on August 27 and left in the field until September 4 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 2 and 3. 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 less than 1% (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 or in combination with Prowl or Prowl H_2O at 0.8 lb ai/ac gave excellent control of Russian thistle (Table 2). All treatments gave 85% or better control of redroot and prostrate pigweed, common lambsquarters, and black nightshade. Russian thistle control increased significantly when Raptor at 0.032 lb ai/ac plus Basagran at 0.25 lb ai/ac was included as a sequential postemergence treatment to preemergence treatments of Outlook, Prowl, and Prowl H_2O (Table 3).

Crop yields: Yields are given in Table 3. Yields were 2,651 to 3,919 lb/ac higher in the herbicide-treated plots compared to the weedy check.

BASF and Gowan, Broadleaf Weed Control in Field Corn with Preemergence Followed by Sequential Postemergence Herbicides

Introduction

Many herbicides can be used in sequential treatments. These trials examined 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 tolerance to applied selected herbicides and corn yield.

Materials and methods

A field experiment was conducted in 2008 at Farmington, NM, to evaluate the response of field corn (Pioneer 36V75) and annual broadleaf weeds to preemergence followed by sequential postemergence herbicides. Soils were a Doak silt loam with a pH of 7.4 and an organic matter content of less than 1%. Soils were fertilized based on soil tests by New Mexico State University. 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 35 psi. Field corn was planted with flexi-planters equipped with disk openers on May 12. Approximately 35 in. of water were applied with a sprinkler during the growing season. Preemergence herbicides were applied on May 14 and immediately incorporated with 0.75 in. of sprinkler-applied water. Soil had a maximum and minimum temperature of 71°F and 56°F, respectively. 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, 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 10 and July 10. Crop injury was evaluated on June 10. Stand counts were made on June 10 by counting individual plants per 10 ft of the third row of each plot. 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 4 and 5. Stand counts are given in Table 4. There were no significant differences among treatments for stand count. On June 10, preemergence treatments of BAS 78102H at 20 fl oz/ac and 13 fl oz/ac and BAS 80004H in combination with Guardsman Max at 3 plus 56 fl oz/ac had the highest crop injury ratings of 9% (Table 4). All preemergence treatments gave excellent control of all broadleaf weeds employed in this study. On July 10, BAS 80004H in combination with Guardsman Max gave only 85% control of redroot pigweed. All treatments gave excellent control of Russian thistle, except BAS 78102H and the weedy check (Table 5).

Crop yields: Yields are given in Table 5. Yields were 144 to 194 bu/ac higher in the herbicide-treated plots compared to the weedy check.

Bayer CropScience, Broadleaf Weed Control in Field Corn with Preemergence, Preemergence Followed by Sequential Postemergence, and Postemergence Treatments

Introduction

Many herbicides can be used in sequential treatments. These trials examined 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 tolerance to applied selected herbicides and corn yield.

Materials and methods

A field experiment was conducted in 2008 at Farmington, NM, to evaluate the response of field corn (Pioneer 36V75) and annual broadleaf weeds to preemergence, preemergence followed by sequential postemergence, and postemergence herbicides. Soils were a Doak silt loam with a pH of 7.4 and an organic matter content of less than 1%. Soils were fertilized based on soil tests by New Mexico State University. 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 35 psi. Field corn was planted with flexi-planters equipped with disk openers on May 12. A total of approximately 35 in. of water were applied with a sprinkler during the growing season. Preemergence herbicides were applied on May 14 and immediately incorporated with 0.75 in. of sprinkler-applied water. Soil had a maximum and minimum temperature of 71°F and 56°F, respectively. Early postemergence treatments were applied on June 10 when field corn was in the 4th leaf stage and weeds were small (<2 in.).

Late postemergence treatments were applied on June 30, when field corn was in the 7th leaf stage and weeds were less than 5 in. tall. 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. Preemergence treatments were evaluated visually on June 10 and July 10. Early and late postemergence treatments were evaluated on July 10 and 30. Crop injury was evaluated on June 10 for preemergence treatments and July 10 and 30 for postemergence treatments. Stand counts were made on June 10 by counting individual plants per 10 ft of the third row of each plot. 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 6 and 7. Stand counts are given in Table 6. On June 10, Balance Pro plus atrazine applied at 1.5 plus 16 oz/ac had the lowest stand count (19) among treatments. Balance Pro plus atrazine applied at 1.5 plus 16 oz/ac had the highest percentage of injury (12%) among treatments. All treatments gave excellent control of redroot and prostrate pigweed, black nightshade, and common lambsquarters. Russian thistle control was poor with atrazine applied at 32 oz/ac (Table 6). On July 10, redroot pigweed control was excellent with all treatments except atrazine applied postemergence at 32 oz/ac and the weedy check. Prostrate pigweed and Russian thistle control were excellent with all treatments except atrazine applied preemergence at 32 oz/ac and the weedy check. Black nightshade and common lambsquarters control were good to excellent with all treatments except the weedy check (Table 7). On July 30, late postemergence treatments of Ignite and Roundup Original MAX gave excellent control of all broadleaf weeds employed in this study (Table 7).

Crop yields: Yields are given in Table 7. Yields were 128 to 184 bu/ac higher in the herbicide-treated plots compared to the weedy check.

Bayer CropScience, Broadleaf Weed Control in Field Corn with Preemergence, Preemergence Followed by Sequential Postemergence, and Postemergence Herbicides

Introduction
Many herbicides can be used in sequential treatments. These trials examined 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 tolerance to applied selected herbicides and corn yield.

Materials and methods
A field experiment was conducted in 2008 at Farmington, NM, to evaluate the response of field corn (Pioneer 36V75) and annual broadleaf weeds to preemergence, preemergence followed by sequential postemergence, and postemergence herbicides. Soils were a Doak silt loam with a pH of 7.4 and an organic matter content of less than 1%. Soils were fertilized based on soil tests by New Mexico State University. 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 35 psi. Field corn was planted with flexi-planters equipped with disk openers on May 12. Approximately 35 in. of water were applied with a sprinkler during the growing season. Preemergence herbicides were applied on May 14 and immediately incorporated with 0.75 in. of sprinkler-applied water. Soil had a maximum and minimum temperature of 71°F and 56°F, respectively. Early postemergence treatments were applied on June 10 when field corn was in the 3rd to 4th leaf stage and weeds were small (<2 in.).

The late postemergence treatment was applied on June 23 when field corn was in the 6th leaf stage and weeds were less than 4 in. tall. 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. Preemergence treatments were evaluated visually on June 10 and July 10. Early and late postemergence treatments were evaluated on July 10 and July 30. Crop injury was evaluated on June 10 for preemergence treatments and on July 10 for postemergence treatments. Stand counts were made on June 10 by counting individual plants per 10 ft of the third row of each plot. 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 8 and 9. Stand counts are given in Table 8. There was no significant difference among treatments for stand count. There were no crop injury symptoms from any of the treatments (data not shown for July 10 and 30 rating period). On June 10, all preemergence treatments gave excellent control of redroot and prostrate pigweed, black nightshade, and common lambsquarters. Outlook at 16 oz/ac gave poor control of Russian thistle (Table 8). On July 10, Laudis plus atrazine applied at 3 plus 16 oz/ac as a sequential postemergence treatment to Outlook applied preemergence at 16 oz/ac increased Russian thistle control approximately 40%. All treatments gave good to excellent control of redroot and prostrate pigweed, black nightshade, and common lambsquarters (Table 9).

Crop yields: Yields are given in Table 9. Yields were 180 to 198 bu/ac higher in the herbicide-treated plots compared to the weedy check.

DuPont Crop Protection, Broadleaf Weed Control in Field Corn with Preemergence, Preemergence Followed by Sequential Postemergence, and Postemergence Herbicides

Introduction
Many herbicides can be used in sequential treatments. These trials examined 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 tolerance to applied selected herbicides and corn yield.

Materials and methods
A field experiment was conducted in 2008 at Farmington, NM, to evaluate the response of field corn (Pioneer 36V75) and annual broadleaf weeds to preemergence, preemergence followed by sequential postemergence, and postemergence herbicides. Soils were a Doak silt loam with a pH of 7.4 and an organic matter content of less than 1%. Soils were fertilized based on soil tests by New Mexico State University. 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 35 psi. Field corn was planted with flexi-planters equipped with disk openers on May 12. Approximately 35 in. of water were applied with a sprinkler during the growing season. Preemergence herbicides were applied on May 14 and immediately incorporated with 0.75 in. of sprinkler-applied water. Soil had a maximum and minimum temperature of 71°F and 56°F, respectively. Postemergence treatments were applied on June 10 when field corn was in the 3rd to 4th 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. Preemergence treatments were evaluated visually on June 10 and July 10. Postemergence treatments were evaluated on July 10. Crop injury was evaluated on June 10 for preemergence treatments and on July 10 for postemergence treatments. Stand counts were made on June 10 by counting individual plants per 10 ft of the third row of each plot. 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 10 and 11. Stand counts are given in Table 10. Matrix plus Balance applied at 0.375 plus 0.75 oz ai/ac caused the highest injury rating of 9% (Table 10). There were no crop injury symptoms from any of the treatments for July 10 (data not shown). There was no significant difference among treatments for stand count (Table 10). On June 10, all preemergence treatments gave good to excellent control of all broadleaf weeds employed in this study except the weedy check (Table 10). On July 10, all treatments gave excellent control of redroot and prostrate pigweed, black nightshade, and common lambsquarters except the weedy check (Table 11). Russian thistle control was poor with Cinch ATZ applied preemergence at 22.4 oz ai/ac followed by a sequential postemergence treatment of Matrix plus Harmony plus Isoxadifen plus atrazine plus Roundup PowerMAX applied postemergence at 0.229 plus 0.05 plus 0.115 plus 8 plus 15 oz ai/ac, Guardsman Max applied preemergence at 30 oz ai/ac followed by a sequential postemergence treatment of Roundup PowerMAX at 15 oz ai/ac, and the postemergence treatment of Matrix plus Harmony plus isoxadifen plus atrazine plus Roundup PowerMAX at 0.229 plus 0.05 plus 0.115 plus 8 plus 15 oz ai/ac (Table 11).

Crop yields: Yields are given in Table 11. Yields were 132 to 179 bu/ac higher in the herbicide-treated plots compared to the weedy check.

Monsanto, 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 can become difficult to control, and corn growth may 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

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

Materials and methods

A field experiment was conducted in 2008 at Farmington, NM, to evaluate the response of field corn (DeKalb, DKC 52-59) and annual broadleaf weeds to postemergence herbicides. Soils were a Doak silt loam with a pH of 7.4 and an organic matter content of less than 1%. Soils were fertilized based on soil tests by New Mexico State University. 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 35 psi. Field corn was planted with flexi-planters equipped with disk openers on May 12. Approximately 35 in. of water were applied with a sprinkler during the growing season. Dual II Mag was applied preemergence to all treatments at 1.12 lb ai/ac on May 14 and was immediately incorporated with 0.75 in. of sprinkler-applied water. Early postemergence treatments were applied on June 10 when field corn was in the 3rd to 4th leaf stage and weeds were small (<2 in.). The late postemergence treatments were applied on June 24 when field corn was in the 6th leaf stage and weeds were less than 4 in. tall. 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 and early and late postemergence treatments were evaluated on July 10 and 24. Stand counts were made on July 10 and 24 by counting individual plants per 10 ft of the third row of each plot. 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 12 and 13. Stand counts are given in Tables 12 and 13. There was no significant difference among treatments for stand count. There were no crop injury symptoms from any of the treatments for both rating periods (Tables 12 and 13). On June 10, all treatments gave excellent control of redroot and prostrate pigweed, black nightshade, and common lambsquarters. Roundup PowerMAX applied at 0.95 lb ai/ac gave poor control of Russian thistle (Table 12). On June 24, all treatments gave good to excellent control of all broadleaf weeds employed in this study (Table 13).

Crop yields: Yields are given in Table 13. Yields were 158 to 173 bu/ac higher in the herbicide-treated plots compared to the weedy check.

DuPont Crop Protection, Broadleaf Weed Control in Express- (Tribenuron) Tolerant Sunflowers with Preemergence Followed by Sequential Postemergence Applications of Express

Introduction

Sunflower is a crop that is usually planted in dryland situations under limited rainfall. Sunflower seed is mainly harvested for its oil content. 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 tolerance to applied selected herbicides and sunflower yield.

Materials and methods

A field experiment was conducted in 2008 at Farmington, NM, to evaluate the response of Express- (tribenuron) tolerant sunflowers (var. Pioneer 63N82) and annual broadleaf weeds to preemergence and preemergence followed by sequential postemergence applications of Express. Sunflowers were planted on June 2 with flexi-planters equipped with disk openers. Soils were fertilized based on soil tests by New Mexico State University. 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 35 psi. Preemergence herbicides were applied on June 3 and immediately incorporated with 0.75 in. of sprinkler-applied water. Postemergence treatments were applied on July 3 when sunflowers were in the 3rd to 4th leaf stage and weeds were less than 4 in. tall. The maximum and minimum air temperatures during postemergence application were 91°F and 60°F, respectively. A total of approximately 28 in. of water were applied with a sprinkler to all plots during the growing season. Preemergence treatments were evaluated for crop injury and weed control on July 3 and August 4. Postemergence treatments of Express were evaluated for crop injury and weed control on 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 on September 22 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 are given in Table 14. Weed control evaluations are given in Tables 14 and 15. No crop injury was noted from any of the preemergence or preemergence followed by sequential postemergence treatments of Express. On July 3, redroot and prostrate pigweed control were excellent with all treatments except Prowl H_2O applied at 0.8 lb ai/ac and the weedy check. All treatments except the weedy check gave better than 92% control of black nightshade and common lambsquarters. Russian thistle control was poor with Dual applied at 1.25 lb ai/ac (Table 14). On August 4, the sequential postemergence treatment of Express applied at 0.015 lb ai/ac to Prowl H_2O and Dual increased redroot pigweed, prostrate pigweed, and Russian thistle control approximately 8%, 12%, and 46%, respectively (Table 15).

Crop yields: Crop yields are given in Table 15. Yields were 2,176 to 2,336 lb/ac higher in the herbicide-treated plots compared to the weedy check.

DuPont Crop Protection, Jim Hill Mustard Control in Winter Wheat

Introduction

Jim Hill mustard, or tumble mustard, is a troublesome weed in winter wheat. If not controlled, it can decrease wheat yields and interfere with combine operations. Field trials were conducted to evaluate the control of Jim Hill mustard by selected herbicides in winter wheat.

Objectives

- Determine efficacy of selected herbicides for control of Jim Hill mustard in winter wheat.
- Determine winter wheat tolerance to applied selected herbicides and winter wheat yield.

Materials and methods

A field experiment was conducted in 2008 on a Wall sandy loam soil (less than 1% organic matter) at Farmington, NM, to evaluate the response of winter wheat and Jim Hill mustard to postemergence herbicides. 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. Winter wheat (var. Jagaline) was planted at 100 lb/ac with a Massey Ferguson grain drill on September 10, 2007. Treatments were applied on April 2, 2008, when winter wheat was in the 4th to 6th tillering stage and Jim Hill mustard was less than 3 in. tall. Maximum and minimum air temperatures during treatment application were 64°F and 33°F, respectively. A total of approximately 30 in. of water were applied with a sprinkler to all treatments during the growing season. Jim Hill mustard infestation was moderate to heavy, with approximately 15 to 25 plants per square yard. Crop injury and weed control evaluations were made on May 5. Winter wheat was harvested on July 24 with 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: Results of crop injury and weed control evaluations are given in Table 16. No crop injury was noted from any of the treatments. All treatments except the weedy check gave good to excellent control of Jim Hill mustard (Table 16).

Crop yields: Results of yield are given in Table 16. Yields were 31 to 43 bu/ac higher in the herbicide-treated plots compared to the weedy check.

DuPont Crop Protection, Control of Downy Brome in Intermediate Wheatgrass at the Steve Trudeau Ranch in Montezuma County, CO

Introduction

Over the past few years, downy brome has become more widespread in native grass fields, causing harvest problems and declines in production of native or non-native grassland pastures and seed cleaning operations. If left unchecked, downy brome can become a serious wildfire hazard.

Objectives

- Determine efficacy of selected herbicides for control of downy brome in intermediate wheatgrass.
- Determine intermediate wheatgrass tolerance to applied selected herbicides.

Materials and methods

A field experiment was conducted in 2008 in Montezuma County, CO, to evaluate the response of downy brome and intermediate wheatgrass to selected postemergence herbicides. 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 35 psi. Treatments were applied on April 29 when intermediate wheatgrass and downy brome were less than 2 in. tall. All treatments were applied with a crop oil concentrate at 1% v/v and 32-0-0 at 2% v/v. Treatments were evaluated for downy brome control on June 4. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Weed control and grass injury evaluations: Weed control and grass injury evaluations for downy brome control in intermediate wheatgrass are given in Table 17. No crop injury was noted from any of the treatments (Table 17). Accent plus Cimarron at 0.623 plus 0.10 oz ai/ac and Accent plus Cimarron plus Karmex at 0.782 plus 0.125 plus 12.8 oz ai/ac gave 90% or better control of downy brome (Table 17).

DuPont Crop Protection, Control of Canada Thistle in Irrigated Pasture at the Joe Lanier Farm in Montezuma County, CO

Introduction

Today over 100 million acres on the North American continent are struggling against invasive 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 Canada thistle, which has spread tremendously throughout San Juan County, NM, and southwestern Colorado.

Objectives

- Determine efficacy of selected herbicides for control of Canada thistle in irrigated pasture.
- Determine irrigated pasture tolerance to applied selected herbicides.

Materials and methods

A field experiment was conducted from 2007 to 2008 in Montezuma County, CO, to evaluate the response of Canada thistle and irrigated pasture to selected postemergence herbicides. 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 35 psi. Treatments were applied on October 10, 2007. Treatments were evaluated for Canada thistle control on June 3, 2008. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Weed control and grass injury evaluations: Evaluations for grass injury and Canada thistle control in irrigated pasture are given in Table 18. No crop injury was noted from any of the treatments (Table 18). All treatments gave excellent control of Canada thistle (Table 18).

Dow AgroSciences, Percent Stand Establishment of Four Rangeland Grasses Under Selected Herbicides

Introduction

The oil and gas industry of San Juan and Rio Arriba Counties in New Mexico must re-seed a well site or pipeline right-of-way once it has been disturbed. Noxious weeds are controlled with herbicides throughout the growing season, regardless of whether a well site or pipeline right-of-way has just been re-seeded. This study attempted to determine if these herbicides used for noxious weed control on well sites or pipeline rights-of-way are impacting grass re-seeding operations.

Objectives

- Evaluate selected rangeland grass establishment following selected herbicide application.

Materials and methods

A field experiment was conducted from 2007 to 2008 at Farmington, NM, to evaluate the response of four rangeland grasses to preemergence applications of Milestone, Tordon, and Transline. The experimental design was a split plot design with rangeland grasses as whole plots and herbicide treatments as sub plots. Individual plots were 12 ft wide by 25 ft long. 'Arriba' western wheatgrass, 'San Luis' slender wheatgrass, bottlebrush squirreltail, and 'Hycrest' crested wheatgrass were planted at 10, 5, 6, and 8 lb pls/ac (pure live seed), respectively, on August 13, 2007. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 35 psi. Treatments were applied on August 16, 2007, and immediately incorporated with 0.75 in. of sprinkler-applied water. Soil minimum and maximum temperatures at time of application were 72°F and 92°F, respectively. Approximately 1.66 in. of precipitation were applied per month from August until October, 2007, and 1 in. from April 1 to 15, 2008. Total precipitation applied was approximately 6.0 in. Rangeland grass was evaluated for percent stand establishment on April 15, 2008. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Stand establishment evaluations: Percent rangeland grass establishment values are given in Table 19. All rangeland grasses showed more tolerance to Transline applied at 21.3 oz/ac than any other herbicide treatment. Tordon applied at 32 oz/ac injured more rangeland grass than did any other herbicide treatment. Bottlebrush squirreltail and 'Hycrest' crested wheatgrass were more susceptible to these herbicides than either 'Arriba' western wheatgrass or 'San Luis' slender wheatgrass (Table 19).

Dow AgroSciences, Percent Stand Establishment of Five Rangeland Grasses Under Selected Herbicides

Introduction

The oil and gas industry of San Juan and Rio Arriba Counties in New Mexico must re-seed a well site or pipeline right-of-way once it has been disturbed. Noxious weeds are controlled with herbicides throughout the growing season, regardless of whether a well site or pipeline right-of-way has just been re-seeded. This study attempted to determine if these herbicides used for noxious weed control on well sites or pipeline rights-of-way are impacting grass re-seeding operations.

Objectives

- Evaluate selected rangeland grass establishment following selected herbicide application.

Materials and methods

A field experiment was conducted in 2008 at Farmington, NM, to evaluate the response of five rangeland grasses to preemergence applications of Milestone, Tordon, Transline, and KJM 44. The experimental design was a split plot design with rangeland grasses as whole plots and herbicide treatments as sub plots. Individual plots were 12 ft wide by 25 ft long. 'Arriba' western wheatgrass, 'San Luis' slender wheatgrass, bottlebrush squirreltail, 'Hycrest' crested wheatgrass, and 'Rimrock' Indian ricegrass were planted at 10, 5, 6, 8 and 6 lb pls/ac (pure live seed), respectively, on April 8. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 35 psi. Treatments were applied on April 14 and immediately incorporated with 0.75 in. of sprinkler-applied water. Soil minimum and maximum temperatures at time of application were 42°F and 66°F, respectively. Approximately 5 in. of water at 1.66 in. per month were applied from mid-April until mid-July. Rangeland grass was evaluated for percent stand establishment on July 21. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Stand establishment evaluations: Percent rangeland grass establishment values are given in Table 20. All rangeland grasses showed more tolerance to Transline applied at 21.3 oz/ac than any other herbicide treatment. Tordon applied at 32 oz/ac injured more rangeland grass than did any other herbicide treatment. Milestone at 5 and 7 oz/ac gave more than 80% stand establishment for 'Arriba' Westernwheatgrass. 'Rimrock' Indian Ricegrass showed excellent stand establishment of 90% to KJM 44 applied at 8 oz/ac, and was the only rangeland grass that was not injured severely (Table 20).

Table 1. Control of Annual Broadleaf Weeds with Raptor Applied Alone or in Combination in Spring-Seeded Alfalfa on July 24, NMSU Agricultural Science Center; at Farmington, NM, 2008

		Crop	Weed Control[b,c]					
	Rate	Injury[b]	Saskr	Amare	Amabl	Solni	Cheal	Yield
Treatments[a]	(lb ai/ac)	(%)	(%)					(t/ac)
Raptor	0.032	0	90	99	100	100	82	2.5
Raptor + Prowl H_2O	0.032 + 1.7	0	91	100	100	100	91	2.4
Raptor + Buctril	0.032 + 0.25	0	100	100	100	100	99	2.3
Raptor + Prowl H_2O	0.032 + 3.4	0	90	100	100	100	93	2.6
Raptor + Buctril	0.032 + 0.5	0	100	100	100	100	97	2.4
Raptor	0.064	0	90	100	100	100	95	2.6
Raptor + Prowl H_2O	0.064 + 1.7	0	91	100	100	100	91	2.4
Weedy check		0	0	0	0	0	1	3.7
LSD 0.05		0	2	1	1	1	4	0.3

[a]Treatments applied with a crop oil concentrate at 0.5 % v/v and 32-0-0 at 2 qt/ac.

[b]Based on a visual scale from 0–100, 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. Control of Annual Broadleaf Weeds in Dry Beans with Preemergence and Preemergence Followed by Sequential Postemergence Treatments on June 30, NMSU Agricultural Science Center; at Farmington, NM, 2008

		Weed Control[b,c]				
	Rate	Cheal	Amare	Amabl	Solni	Saskr
Treatments[a]	(lb ai/ac)	(%)				
Valor	0.05	100	99	99	99	98
Outlook	0.56	100	98	100	98	37
Valor + Prowl	0.05 + 0.8	100	99	99	100	99
Valor + Prowl H_2O	0.05 + 0.8	100	99	99	99	99
Outlook + Prowl	0.56 + 0.8	100	100	100	99	52
Outlook + Prowl H_2O	0.56 + 0.8	100	99	100	99	63
Valor/Raptor + Basagran[a]	0.05/0.032 + 0.25	100	98	100	99	98
Outlook/Raptor + Basagran[a]	0.56/0.032 + 0.25	100	99	100	98	58
Outlook + Prowl/Raptor + Basagran[a]	0.56 + 0.8/0.032 + 0.25	100	99	100	99	65
Outlook + Prowl H_2O/Raptor + Basagran[a]	0.56 + 0.8/0.032 + 0.25	100	99	100	99	65
Valor + Prowl H_2O/Raptor + Basagran[a]	0.05 + 0.8/0.032 + 0.25	100	100	100	98	98
Weedy check		0	0	0	0	0
LSD 0.05		1	1	1	2	4

[a]First treatment applied preemergence and evaluated on June 30, followed by a sequential postemergence treatment. Postemergence treatments were applied with a crop oil concentrate at 0.5% v/v and 32-0-0 at 2% v/v.

[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 3. Control of Annual Broadleaf Weeds in Dry Beans with Preemergence and Preemergence Followed by Sequential Postemergence Treatments on July 31; NMSU Agricultural Science Center at Farmington, NM, 2008

Treatments[a]	Rate (lb ai /ac)	Cheal	Amare	Amabl	Solni	Saskr	Bill Z Yield (lb/ac)
		Weed Control[b,c] (%)					
Valor	0.05	98	96	97	96	97	3,996
Outlook	0.56	97	90	90	85	32	3,112
Valor + Prowl	0.05 + 0.8	99	97	96	96	97	4,380
Valor + Prowl H_2O	0.05 + 0.8	99	95	96	96	97	4,265
Outlook + Prowl	0.56 + 0.8	99	90	92	91	36	3,226
Outlook + Prowl H_2O	0.56 + 0.8	100	95	94	93	45	3,381
Valor/Raptor + Basagran[a]	0.05/0.032 + 0.25	100	97	98	98	95	4,034
Outlook/Raptor + Basagran[a]	0.56/0.032 + 0.25	99	97	98	96	95	4,111
Outlook + Prowl/Raptor + Basagran[a]	0.56 + 0.8/0.032 + 0.25	99	99	97	97	95	3,880
Outlook + Prowl H_2O/Raptor + Basagran[a]	0.56 + 0.8/0.032 + 0.25	99	97	95	97	93	3,919
Valor + Prowl H_2O/Raptor + Basagran[a]	0.05 + 0.8/0.032 + 0.25	99	99	98	97	98	4,111
Weedy check		0	0	0	0	0	461
LSD 0.05		2	2	4	3	6	607

[a]First treatment applied preemergence and rated on June 30, followed by a sequential postemergence treatment and rated on July 31. Postemergence treatments were applied with a crop oil concentrate at 0.5% v/v and 32-0-0 at 2% v/v.

[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 4. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence Herbicides in Field Corn on June 10, NMSU Agricultural Science Center; at Farmington, NM, 2008

Treatments[a,b]	Rate (fl oz/ac)	Stand Count	Crop Injury[f] (%)	Amare	Amabl	Solni	Saskr	Cheal
				Weed Control[f,g] (%)				
BAS 78102H	20	21	9	100	100	100	100	100
BAS 80004H + Guardsman Max (pm)	3 + 56	20	9	100	100	100	100	100
Lumax (pm)	80	20	0	100	00	100	100	100
BAS 78102H/Roundup PowerMAX[c]	13/32	21	9	100	100	100	100	100
BAS 80004H + Guardsman Max (pm)/ Roundup PowerMAX[c]	2.5 + 40/32	21	7	100	100	100	100	100
Harness Xtra (pm)/Roundup PowerMAX[c]	39/32	21	0	100	100	100	98	100
BAS 78102H/Roundup PowerMAX + Status[c,e]	13/32 + 2.5	21	4	100	100	100	98	100
Lumax (pm)/Yukon (pm)[d,e]	80/8	22	0	100	100	100	100	100
Guardsman Max (pm)/Yukon (pm)[d,e]	56/8	23	3	100	100	100	100	100
Lumax/Yukon (pm)[e] + Roundup PowerMAX[c]	80/4 + 32	21	0	100	100	100	100	100
Guardsman Max (pm)/Yukon (pm)[e] + Roundup PowerMAX[c]	56/4 + 32	22	3	100	100	100	100	100
Weedy check		22	0	0	0	0	0	0
LSD 0.05		ns	3	1	1	1	1	1

[a]pm = packaged mix.

[b]First treatment applied preemergence followed by a slash then a postemergence treatment.

[c]A nonionic surfactant and ammonium sulfate (AMS) were added to treatments at 0.25% v/v and 5.5 lb/ac, respectively.

[d]A nonionic surfactant was added to treatments at 0.25% v/v.

[e]Treatments are in oz wt/ac.

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

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

Table 5. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence and Postemergence Herbicides in Field Corn on July 10; NMSU Agricultural Science Center at Farmington, NM, 2008

Treatments[a,b]	Rate (fl oz/ac)	Weed Control[f,g] Amare	Amabl	Solni	Saskr	Cheal	Yield (bu/ac)
		(%)					
BAS 78102H	20	100	100	100	81	100	200
BAS 80004H + Guardsman Max (pm)	3 + 56	85	99	100	100	100	203
Lumax (pm)	80	100	100	100	100	100	244
BAS 78102H/Roundup PowerMAX[c]	13/32	99	99	100	96	100	206
BAS 80004H + Guardsman Max (pm)/ Roundup PowerMAX[c]	2.5 + 40/32	99	100	100	100	100	206
Harness Xtra (pm)/Roundup PowerMAX[c]	39/32	99	100	100	100	100	246
BAS 78102H/Roundup PowerMAX + Status[c,e]	13/32 + 2.5	100	100	100	99	100	209
Lumax (pm)/Yukon (pm)[d,e]	80/8	100	100	100	100	100	248
Guardsman Max/Yukon (pm)[d,e]	56/8	100	100	100	100	100	229
Lumax (pm)/Yukon (pm)[e] + Roundup PowerMAX[c]	80/4 + 32	100	100	100	100	100	247
Guardsman Max (pm)/Yukon (pm)[e] + Roundup PowerMAX[c]	56/4 + 32	100	100	100	100	100	250
Weedy check		0	0	0	0	0	56
LSD 0.05		2	1	1	2	1	6

[a]pm = packaged mix.

[b]First treatment applied preemergence followed by a slash then a postemergence treatment.

[c]A nonionic surfactant and ammonium sulfate (AMS) were added to treatments at 0.25% v/v and 5.5 lb/ac, respectively.

[d]A nonionic surfactant was added to treatments at 0.25% v/v.

[e]Treatments are in oz wt/ac.

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

Table 6. Control of Annual Broadleaf Weeds with Preemergence Herbicides in Field Corn on June 10; NMSU Agricultural Science Center at Farmington, NM, 2008

Treatments	Rate (oz/ac)	Stand Count	Crop Injury[a] (%)	Weed Control[a,b] Amare	Amabl	Solni	Saskr	Cheal
				(%)				
Corvus	3.3	23	2	100	100	100	100	100
Corvus + atrazine	3.3 + 32	22	2	100	100	100	100	100
Balance Flexx + atrazine	5 + 32	23	2	100	100	100	100	100
Balance Flexx + atrazine	3 + 32	23	0	100	100	100	100	100
Balance Pro + atrazine	1.5 + 16	19	12	100	100	100	100	100
Atrazine	32	22	0	100	98	96	81	100
Balance Flexx	5	21	2	100	100	100	100	100
Lumax	80	23	0	100	100	100	99	100
Balance Flexx	3	22	1	100	100	100	100	100
Balance Flexx + atrazine	3 + 32	23	0	100	100	100	100	100
Weedy check		23	0	0	0	0	0	0
LSD 0.05		2	2	1	1	1	5	1

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

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

Table 7. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence and Postemergence Herbicides in Field Corn on July 10 and 30; NMSU Agricultural Science Center at Farmington, NM, 2008

		Weed Control[f,g]					
	Rate	Amare	Amabl	Solni	Saskr	Cheal	Yield
Treatments[a]	(oz/ac)	(%)					(bu/ac)
Corvus	3.3	98	100	100	100	100	248
Corvus + atrazine	3.3 + 32	100	100	100	100	100	246
Corvus + atrazine[b]	2.2 + 32	98	99	100	100	100	252
Balance Flexx + atrazine	5 + 32	99	100	100	100	100	246
Balance Flexx + atrazine	3 + 32	100	100	100	100	100	249
Balance Pro + atrazine	1.5 + 16	95	99	100	100	100	248
Atrazine	32	99	84	94	76	100	196
Balance Flexx	5	96	100	100	100	100	249
Lumax	80	98	100	100	100	100	242
Balance Flexx + atrazine[b]	5/16	100	100	100	100	100	246
Balance Flexx/atrazine[b]/Ignite[c,d]	3/16/23	100	100	100	100	100	251
Balance Flexx + atrazine/Roundup Original MAX[c,d]	3 + 32/22	100	100	100	100	100	251
Atrazine[b,e]	32	75	94	91	99	100	207
Balance Flexx + atrazine[b]	3 + 16	99	100	100	100	100	247
Balance Flexx + atrazine[b,e]	3 + 16	99	100	100	100	100	252
Weedy check		0	0	0	0	0	68
LSD 0.05		3	2	2	1	1	16

[a]First treatment applied preemergence followed by a slash then a postemergence treatment.

[b]Postemergence treatments applied June 10 at the V-4 stage of corn.

[c]Postemergence treatments applied June 30 at the V-7 stage of corn.

[d]Ammonium sulfate added at 3 lb/ac.

[e]A crop oil concentrate added at 32 oz/ac.

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

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

Table 8. Control of Annual Broadleaf Weeds with Preemergence Herbicides in Field Corn on June 10; NMSU Agricultural Science Center at Farmington, NM, 2008

			Crop	Weed Control[a,b]				
	Rate	Stand	Injury[a]	Amare	Amabl	Solni	Saskr	Cheal
Treatments	(oz/ac)	Count	(%)	(%)				
Balance Flexx	3	21	0	100	100	100	96	100
Outlook	16	21	0	98	99	96	61	99
Guardsman Max	50	22	0	100	100	100	98	100
Bicep Lite II	50	22	0	100	100	100	98	100
Weedy check		22	0	0	0	0	0	0
LSD 0.05		ns	1	1	1	3	6	1

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

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

Table 9. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence and Postemergence Herbicides in Field Corn on July 10; NMSU Agricultural Science Center at Farmington, NM, 2008

		Weed Control[f,g]					
	Rate	Amare	Amabl	Solni	Saskr	Cheal	Yield
Treatments[a]	(oz/ac)	(%)					(bu/ac)
Laudis + atrazine[b]	3 + 16	100	100	100	100	100	247
Laudis[c]	3	99	100	100	100	100	250
Balance Flexx/Laudis + atrazine[b]	3/3 + 16	100	100	100	100	100	248
Outlook/Laudis + atrazine[b]	16/3 + 16	95	100	100	100	100	248
Ignite 280 + Laudis[d]	22 + 2	98	100	100	100	100	247
Ignite 280 + Laudis + atrazine[d]	22 + 2 + 16	100	100	100	100	100	250
Roundup Original MAX + Laudis[d]	22 + 3	90	100	100	100	100	248
Roundup Original MAX + Laudis + atrazine[d]	22 + 3 + 16	97	100	100	100	100	256
Laudis + Buctril[b,e]	3 + 6	100	100	100	100	100	238
Capreno + atrazine[b]	3 + 16	100	100	100	100	100	247
Capreno[b]	3	100	100	100	100	100	248
Capreno + Roundup Original MAX[d]	3 + 22	100	100	100	93	100	248
Capreno + Ignite 280[d]	3 + 22	100	100	100	88	100	249
Guardsman Max/Roundup Original MAX[d]	48/22	100	100	100	100	100	254
Bicep Lite II Mag/Roundup Original MAX[d]	48/22	100	100	100	100	100	255
Weedy check		0	0	0	0	0	58
LSD 0.05		1	1	1	2	1	15

[a]First treatment applied preemergence followed by a slash then a sequential postemergence treatment.

[b]Treatments applied with a crop oil concentrate at 1% v/v and 32-0-0 at 48 oz/ac.

[c]Treatment applied with methylated seed oil at 1% v/v and 32-0-0 at 48 oz/ac.

[d]Ammonium sulfate added at 3 lb/ac.

[e]Treatment applied late postemergence on June 23 to the 6th leaf stage of corn; all other postemergence treatments were applied on June 10 to the 3rd or 4th leaf stage of corn.

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

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

Table 10. Control of Annual Broadleaf Weeds with Preemergence Herbicides in Field Corn on June 10; NMSU Agricultural Science Center at Farmington, NM, 2008

			Crop	Weed Control[a,b]				
	Rate	Stand	Injury[a]	Amare	Amabl	Solni	Saskr	Cheal
Treatments	(oz ai/ac)	Count	(%)	(%)				
Cinch ATZ	22.4	22	0	100	100	100	96	100
Matrix + Balance	0.375 + 0.75	24	9	99	99	100	99	100
Guardsman Max	30	23	2	100	100	100	94	100
Lumax	30	23	2	100	100	100	92	100
Bicep Lite II	32	24	0	100	100	100	92	100
Weedy check		23	0	0	0	0	0	0
LSD 0.05		ns	1	1	1	1	1	1

[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, Saskr = Russian thistle, and Cheal = common lambsquarters.

Table 11. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence and Postemergence Herbicides in Field Corn on July 10; NMSU Agricultural Science Center at Farmington, NM, 2008

		Weed Control[e,f]					
	Rate	Amare	Amabl	Solni	Saskr	Cheal	Yield
Treatments[a]	(oz ai/ac)	(%)					(bu/ac)
Cinch ATZ/Matrix + Accent + isoxadifen + Impact + atrazine[c]	22.4/0.25 + 0.375 + 0.125 + 0.175 + 8	100	100	100	100	100	247
Cinch ATZ/Matrix + Harmony + isoxadifen + atrazine + Roundup PowerMAX[d]	22.4/0.229 + 0.05 + 0.115 + 8 + 15	100	100	100	72	100	249
Cinch ATZ/Matrix + Clarity + isoxadifen + atrazine + Roundup PowerMAX[d]	22.4/0.25 + 1.925 + 0.125 + 8 + 15	100	100	100	100	100	251
Matrix + Balance/Roundup PowerMAX[d]	0.375 + 0.75/15	100	100	100	98	100	206
Matrix + Harmony + isoxadifen + atrazine + Roundup PowerMAX[b,d]	0.229 + 0.05 + 0.115 + 8 + 15	100	100	100	75	100	249
Matrix + Clarity + isoxadifen + atrazine + Roundup PowerMAX[b,d]	0.25 + 1.925 + 0.125 + 8 + 15	100	100	100	100	100	252
Guardsman Max/Matrix + Accent + isoxadifen + Impact + atrazine[c]	30/0.25 + 0.375 + 0.125 + 0.175 + 8	100	100	100	100	100	251
Bicep Lite II Mag/Matrix + Accent + isoxadifen + Impact + atrazine[c]	32/0.25 + 0.375 + 0.125 + 0.175 + 8	100	100	100	100	100	252
Lumax/Roundup PowerMAX[d]	30/15	100	100	100	85	100	251
Guardsman Max/Roundup PowerMAX[d]	30/15	97	100	100	73	100	251
Bicep Lite II Mag/Roundup PowerMAX[d]	32/15	98	100	100	85	100	251
Weedy check		0	0	0	0	0	74
LSD 0.05		1	1	1	1	1	10

[a]First treatment applied preemergence followed by a slash then a sequential postemergence treatment.

[b]Treatments applied postemergence on June 10.

[c]Treatments applied with methylated seed oil at 1% v/v and ammonium sulfate at 32 oz/ac.

[d]Treatments applied with ammonium sulfate at 32 oz/ac.

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

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

Table 12. Control of Annual Broadleaf Weeds with Postemergence Herbicides in Roundup Ready Field Corn on June 10; NMSU Agricultural Science Center at Farmington, NM, 2008

			Crop	Weed Control[c,d]					
	Rate	Stand	Injury[c]	Amare	Amabl	Solni	Saskr	Cheal	Yield
Treatments	(lb ai/ac)	Count	(%)	(%)					(bu/ac)
Impact[a]	0.011	25	0	100	00	100	91	100	252
Impact + Roundup PowerMAX[b]	0.011 + 0.95	26	0	100	100	100	100	100	259
Impact[a]	0.016	26	0	98	100	100	90	100	249
Impact + Roundup PowerMAX[b]	0.016 + 0.95	25	0	100	100	100	100	100	262
Status[a]	0.095	26	0	100	100	100	100	100	253
Status + Roundup PowerMAX[b]	0.095 + 0.95	25	0	100	100	100	100	100	257
Status[a]	0.19	24	0	98	100	100	100	100	257
Status + Roundup PowerMAX[b]	0.19 + 0.95	25	0	100	100	100	100	100	255
Roundup PowerMAX[b]	0.95	25	0	99	100	100	65	100	225
Weedy check		25	0	0	0	0	0	0	68
LSD 0.05		ns		1	1	1	2	1	11

[a]Treatments applied with a crop oil concentrate at 1% v/v and ammonium sulfate at 5 lb/ac.

[b]Treatments applied with ammonium sulfate at 5 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, Saskr = Russian thistle, and Cheal = common lambsquarters.

Table 13. Control of Annual Broadleaf Weeds with Postemergence Herbicides in Roundup Ready Field Corn on June 24; NMSU Agricultural Science Center at Farmington, NM, 2008

Treatments	Rate (lb ai/ac)	Stand Count	Crop Injury[c] (%)	Weed Control[c,d] Amare (%)	Amabl	Solni	Saskr	Cheal	Yield (bu/ac)
Impact[a]	0.011	25	0	94	98	97	96	99	229
Impact + Roundup PowerMAX[b]	0.011 + 0.95	25	0	98	100	98	95	100	241
Impact[a]	0.016	25	0	99	100	99	99	100	238
Impact + Roundup PowerMAX[b]	0.016 + 0.95	26	0	98	100	100	98	100	231
Status[a]	0.19	23	0	99	100	100	100	100	226
Status + Roundup PowerMAX[b]	0.19 + 0.95	24	0	100	100	100	100	100	238
Weedy check		24	0	0	0	0	0	0	68
LSD 0.05		ns	1	2	1	1	2	1	11

[a]Treatments applied with a crop oil concentrate at 1% v/v and ammonium sulfate at 5 lb/ac.

[b]Treatments applied with ammonium sulfate at 5 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, Saskr = Russian thistle, and Cheal = common lambsquarters.

Table 14. Control of Annual Broadleaf Weeds in Pioneer 63N82 Express Tolerant Sunflowers with Preemergence Herbicides on July 3; NMSU Agricultural Science Center at Farmington, NM, 2008

Treatments	Rate (lb ai/ac)	Crop Injury[a] (%)	Weed Control[a,b] Amare (%)	Amabl	Solni	Cheal	Saskr
Express	0.031	0	100	100	99	96	84
Express	0.062	0	100	100	99	97	85
Spartan	0.094	0	100	100	98	100	100
Spartan	0.14	0	100	100	100	100	100
Dual	1.25	0	100	100	100	92	52
Prowl H_2O	0.8	0	85	88	94	100	86
Weedy check		0	0	0	0	0	0
LSD 0.05		1	2	2	1	3	2

[a]Based on a visual scale from 0–100, where 0 = no control or crop injury and 100 = dead plants.
[b]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 15. Yield and Control of Annual Broadleaf Weeds in Pioneer 63N82 Express Tolerant Sunflowers with Preemergence and Preemergence Followed by Sequential Applications of Express on August 4; NMSU Agricultural Science Center at Farmington, NM, 2008

Treatments[a]	Rate (lb ai/ac)	Weed Control[b,c] Amare (%)	Amabl	Solni	Cheal	Saskr	Yield (lb/ac)
Express	0.031	97	96	98	94	82	3,456
Express	0.062	97	99	99	96	82	3,552
Spartan	0.094	100	100	97	100	100	3,513
Spartan	0.14	100	100	100	100	100	3,616
Spartan/Express	0.14/0.007	100	100	100	100	100	3,558
Spartan/Express	0.14/0.015	100	100	100	100	100	3,603
Spartan/Express	0.094/0.007	100	100	100	100	100	3,488
Spartan/Express	0.094/0.015	100	100	100	100	100	3,494
Dual/Express	1.25/0.015	100	100	100	98	98	3,456
Prowl H_2O/Express	0.8/0.015	100	96	99	98	98	3,462
Weedy check		0	0	0	0	0	1,280
LSD 0.05		1	1	1	1	2	303

[a]First treatment applied preemergence followed by a sequential postemergence treatment of Express with crop oil concentrate at 1% v/v.
[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 16. Control of Jim Hill Mustard in Winter Wheat with Selected Herbicides on May 5; NMSU Agricultural Science Center at Farmington, NM, 2008

Treatments	Rate (oz ai/ac)	Crop Injury[c] (%)	Weed Control SSYAL[c,d] (%)	Yield (bu/ac)
San 845H + DPX M6316 + DPXL5300 + Ally XP[a]	1.02 + 0.076 + 0.038 + 0.03	0	98	113
San 845H + DPX M6316 + DPXL5300 + Ally XP[a]	2.04 + 0.151 + 0.076 + 0.061	0	98	109
San 845H + DPX M6316 + DPXL5300 + Ally XP + 2,4-D ester[a]	1.02 + 0.076 + 0.038 + 0.03 + 4	0	100	115
San 845H + DPX M6316 + DPXL5300 + Ally XP + 2,4-D ester[a]	2.04 + 0.151 + 0.076 + 0.061 + 4	0	100	116
San 845H + DPX M6316 + DPXL5300 + Ally XP + MCP ester[a]	1.02 + 0.076 + 0.038 + 0.03 + 4	0	98	114
San 845H + DPX M6316 + DPXL5300 + Ally XP + MCP ester[a]	2.04 + 0.151 + 0.076 + 0.061 + 4	0	100	115
Huskie[b]	2.3	0	89	121
Huskie[b]	3.3	0	88	117
DPX M6316[a]	0.3	0	98	111
DPX M6316 + Prowl H_2O[a]	0.3 + 16	0	98	112
Huskie + Prowl H_2O[b]	3.3 + 16	0	87	112
Weedy check		0	0	78
LSD 0.05		0	10	6

[a]Treatments applied with a non-ionic surfactant (NIS) at 0.25% v/v.

[b]Treatments applied with 32-0-0 at 2 qt/ac.

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

[d]SSYAL = Jim Hill mustard.

Table 17. Control of Downy Brome in Intermediate Wheatgrass on June 4; at the Steve Trudeau Ranch in Montezuma County, CO, 2008

Treatments[a]	Rate (oz ai/ac)	Intermediate Wheatgrass Injury[b] (%)	Weed Control Brote[c] (%)
Accent + Cimarron	0.469 + 0.075	0	75
Accent + Cimarron	0.623 + 0.10	0	92
Accent + Cimarron	0.782 + 0.125	0	72
Accent + Cimarron	0.938 + 0.15	0	88
Accent + Cimarron + Karmex	0.623 + 0.10 + 12.8	0	88
Accent + Cimarron + Karmex	0.782 + 0.125 + 12.8	0	91
Outrider	1.0	0	80
KJM 44	1.25	0	73
KJM 44	2.5	0	85
Weedy check		0	0
LSD 0.05		1	27

[a]Treatments applied with crop oil concentrate at 1% v/v and 32-0-0 at 2% v/v.

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

[c]Brote = downy brome.

Table 18. Control of Canada Thistle in Irrigated Pasture on June 3; at the Joe Lanier Farm in Montezuma County, CO, 2008

Treatments	Rate (oz ai/ac)	Irrigated Pasture Injury[a] (%)	Weed Control CIRAR[a,b] (%)
KJM44	0.5	0	100
KJM 44	1	0	100
KJM 44	2	0	100
KJM 44	2	0	100
KJM 44	3	0	99
KJM 44	4	0	100
Milestone	1.25	0	100
Milestone	1.75	0	100
Telar XP	0.75	0	100
Weedy check		0	0
LSD 0.05		1	1

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

[b]CIRAR = Canada thistle.

Table 19. Percent Stand Establishment of Four Rangeland Grasses Under Preemergence Applications of Milestone, Tordon, and Transline on April 15; at Farmington, NM, 2008

	Rate	Percent Rangeland Grass Establishment[a]				Average
Treatments	(oz/ac)	AWW	SLSW	BBST	HCCW	Means
Milestone	3	87	54	22	35	53
Milestone	5	51	48	7	21	36
Milestone	7	86	27	5	18	34
Transline	21.3	94	78	87	39	74
Tordon	32	40	19	2	4	16
Untreated		100	100	100	100	100
Treatment means[b]		78[1]	55[2]	37[3]	39[3]	

[a]AWW = 'Arriba' western wheatgrass, SLSW = 'San Luis' slender wheatgrass, BBST = bottlebrush squirreltail, and HCCW = 'Hycrest' crested wheatgrass.

[b]Means followed by the same number are not significantly different as determined by the LSD test at 0.05.

Table 20. Percent Stand Establishment of Five Rangeland Grasses Under Preemergence Applications of Milestone, Tordon, Transline, and KJM 44 on July 21; at Farmington, NM, 2008

	Rate	Percent Rangeland Grass Establishment[a]					Average
Treatments	(oz/ac)	AWW	SLSW	BBST	HCCW	RRIR	Means
Milestone	5	90	55	40	13	93	58
Milestone	7	80	12	18	5	15	26
Transline	21.3	100	93	95	97	97	96
Tordon	32	25	8	8	12	10	13
KJM 44	8	10	4	4	4	90	23
Untreated		100	100	100	100	100	100
Treatment means[b]		68[1]	45[2]	44[2]	39[2]	67[1]	

[a]AWW = 'Arriba' western wheatgrass, SLSW = 'San Luis' slender wheatgrass, BBST = bottlebrush squirreltail, HCCW = 'Hycrest' crested wheatgrass, and RRIR = 'Rimrock' Indian ricegrass.

[b]Means followed by the same number are not significantly different as determined by the LSD test at 0.05.

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.

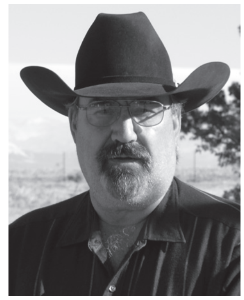
Currie, R.S. 2004. Comparisons of 40 herbicide tank mixes for weed control in Round-up ready corn. In *Field Day 2004, Southwest Research-Extension Center, Report of Progress 927* (pp. 34–36). Manhattan, KS: Kansas Agricultural Experiment Station, Kansas State University.

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.



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April 2012 **Las Cruces, NM**