Pest Control In Crops Grown in Northwestern New Mexico, 2010

Annual Data Report 100-2010

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

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INTRODUCTION

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

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

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

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

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

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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 CropScience, 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 Field Corn with Preemergence Followed by Sequential Late Postemergence Herbicides

Introduction

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

Objectives

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

Materials and methods

A field experiment was conducted in 2010 at Farmington, NM, to evaluate the response of field corn (Pioneer PO751HR) and annual broadleaf weeds to preemergence followed by sequential late postemergence herbicides. Soils were a Doak silt loam with a pH of 7.4 and an organic matter content of less than 0.5%. Soils were fertilized according to New Mexico State University recommendations based on soil tests. The experimental design was a randomized complete block with four replications. Individual plots were four 30-in. rows 30 feet 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 10. Preemergence herbicides were applied on May 12 and immediately incorporated with 0.75 in. of sprinkler-applied water. Soil had maximum and minimum temperatures of 70 and 54°F, respectively. Late postemergence treatments were applied on June 28 when field corn was 12 to 14 in. tall and weeds averaged 6 inches tall. Maximum and minimum air temperatures during late postemergence applications were 91 and 60°F, respectively. Black nightshade and redroot and prostrate pigweed infestations were heavy and common lambsquarters and Russian thistle infestations were moderate throughout the experimental area. Preemergence treatments were visually rated for crop injury on June 10 and for weed control on June 10 and July 7. Sequential late postemergence treatments were visually rated for weed control on July 7. Stand counts were made on June 10 by counting individual plants per 10 ft of the third row of each plot. Field corn was harvested on November 19 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 crop injury evaluations: Crop injury evaluations and stand counts are given in Table 1. Weed control evaluations are given in Tables 1 and 2. There was no crop injury and there were no significant differences among treatments for stand count (Table 1). On June 10, all treatments except the check gave excellent control of redroot and prostrate pigweed, black nightshade, and common lambsquarters. Russian thistle control was poor with Integrity applied preemergence at 13 oz/ac (Tables 1 and 2). On July 7, when Status and Roundup Powermax plus a nonionic surfactant plus ammonium sulfate were added as a late postemergence at 2.5 plus 22 plus 10 oz/ac plus 5 lb/ac applied to Integrity applied preemergence at 10 oz/ac, Russian thistle control increased approximately 22%, (Table 2).

Crop yields: Yields are given in Table 2. Yields were 177 to 207 bu/ac higher in the herbicide-treated plots as compared to the weedy check.

Bayer CropScience, Broadleaf Weed Control in Field Corn with Early and Late Postemergence Herbicides

Introduction

Postemergence herbicides are most effective if applied when the weeds and field corn are small. If weeds are not controlled, weeds then become difficult to control and corn growth is restricted. This trial examined the efficacy of postemergence herbicides applied to corn in the 5th and 7th leaf stage and to weeds, and evaluated herbicides' effects on crop injury and field corn yields.

Objectives

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

Materials and methods

A field experiment was conducted in 2010 at Farmington, NM, to evaluate the response of field corn (Pioneer PO751HR) and annual broadleaf weeds to early postemergence and late postemergence herbicides. Soils were a Doak silt loam with a pH of 7.4 and an organic matter content of less than 0.5%. 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 30-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 10. Approximately 35 in. of water were applied during the growing season using sprinklers. Early postemergence treatments were applied on May 28 when field corn was in the 5th leaf stage and weeds were small (<4 in.). The late postemergence treatments were applied on June 28 when field corn was in the 7th leaf stage and weeds were more than 4 in. tall. Maximum and minimum air temperatures during early and late postemergence applications were 94 and 57°F and 91 and 60°F, respectively.

Black nightshade and redroot and prostrate pigweed infestations were heavy and common lambsquarters and Russian thistle infestations were moderate throughout the experimental area. Early and late postemergence treatments were evaluated for crop injury on June 28 and for weed control June 28 and July 7. Stand counts were made on June 28 by counting individual plants per 10 ft of the third row of each plot. Field corn was harvested on November 19 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 crop injury evaluations: Weed control and crop injury evaluations and stand counts are given in Table 3. There was no crop injury from any of the treatments. On June 28, Ignite 280 at 22 oz/ac in combination with either Capreno or Laudis at 2 oz/ac, atrazine at 32 oz/ac, and either ammonium sulfate at 5 lb/ac or Coron at 128 oz/ac gave excellent control of redroot and prostrate pigweed, black nightshade, Russian thistle, and common lambsquarters (Table 3). On July 7, the sequential postemergence treatment of Ignite plus ammonium sulfate increased Russian thistle control approximately 33% (Table 3).

Crop yields: Yields are given in Table 3. Yields were 159 to 189 bu/ac higher in the herbicide-treated plots as compared to the check.

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

Introduction

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

Objectives

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

Materials and methods

A field experiment was conducted in 2010 at Farmington, NM, to evaluate the response of field corn (Pioneer PO751HR) and annual broadleaf weeds to preemergence and 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 0.5%. 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 30-in. rows 30 feet 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 10. Preemergence herbicides were applied on May 12 and immediately incorporated with 0.75 in. of sprinkler-applied water. Soil had a maximum and minimum temperature of 70 and 54°F, respectively. Postemergence treatments were applied on June 1 when field corn was in the 2nd to 3rd leaf stage and weeds were small (<2 in.). The other postemergence treatments were applied on June 9 when field corn was in the 4th to 5th leaf stage and weeds were less than 4 in. tall. Maximum and minimum air temperatures for the postemergence applications on June 1 and June 8 were 85 and 52°F and 91 and 60°F, respectively. Black nightshade and redroot and prostrate pigweed infestations were heavy and common lambsquarters and

Russian thistle infestations were moderate throughout the experimental area. Preemergence treatments were evaluated for weed control on June 8 and 28. Postemergence treatments were evaluated on June 28. Crop injury was evaluated on June 8 for preemergence treatments and on June 28 for postemergence treatments. Stand counts were made on June 8 by counting individual plants per 10 ft of the third row of each plot. Field corn was harvested on November 19 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 crop injury evaluations: Weed control evaluations are given in Tables 4 and 5. Crop injury evaluations and stand counts are given in Table 4. There was no crop injury from any of the treatments (Table 4). On June 8, all preemergence treatments gave excellent control of redroot and prostrate pigweed, black nightshade, Russian thistle, and common lambsquarters (Table 4).

Crop yields: Yields are given in Table 5. Yields were 166 to 189 bu/ac higher in the herbicide-treated plots as compared to the check.

Microbial Energy, Inc. and True Green Organics, Microbial Use in Field Corn Production

Introduction

Using microbes to increase production in crops is gaining acceptance as an agronomic practice. The idea is to use less fertilizer (nitrogen) and to let the microbes work with the soil to increase yields.

Objectives

- Determine if microbes will indeed maintain or increase production yields without the full rate of nitrogen applied to field corn.

Materials and methods

A field experiment was conducted in 2010 at Farmington, NM, to evaluate the response of field corn (Pioneer PO751HR) when using less applied nitrogen and instead using microbes to maintain or increase yields. Soils were a Doak silt loam with a pH of 7.4 and an organic matter content of less than 0.5%. All plots were fertilized with a starter fertilizer consisting of 100 lb/ac 11-52-0 in combination with 100 lb/ac of 0-0-60 on May 1. Starter fertilizer was then disked into the soil to a depth of approximately 4 in. The remaining ammonium nitrate solution (32-0-0) was applied at increments of 30 lb N/ac (90 lb N/ac total) until June 15. This made an application of approximately 100 lb N/ac applied for the growing season instead of 200 lb N/ac, which is normally used on these soils and in this area. Individual plots were four 30-in. rows 30 ft long. The experimental design was a randomized complete block with three replications. 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 10. Preemergence treatments were applied on May 17 and immediately incorporated with 0.75 in. of sprinkler-applied water. Approximately 35 in. of sprinkler water were applied during the growing season. Maximum and minimum soil temperatures during application were 69 and 56°F, respectively. Postemergence treatments were applied on June 8. Maximum and minimum air temperatures during postemergence applications were 94 and 60°F, respectively. Bicep Lite II Max was applied preemergence on May 12 at 55 oz/ac, followed by a postemergence treatment of Status and Prowl H_2O applied at 3 plus 32 oz/ac on June 8. Field corn was harvested on November 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

Crop yields: Yields are given in Table 6. There were no significant treatments for yield (Table 6). Research should continue in the area of using microbes in combination with reduced fertilizer nitrogen for maximum crop production.

Bayer CropScience, Broadleaf Weed Control in Grain Sorghum with Preemergence Followed by Sequential Early and Late Postemergence Herbicides

Introduction

Postemergence herbicides are most effective if applied when the weeds and grain sorghum are small. If weeds are not controlled, weeds then become difficult to control and grain sorghum growth is restricted. This trial examined the efficacy of preemergence followed by sequential early and late postemergence herbicides applied to grain sorghum and weeds, and evaluated their effect on crop injury and grain sorghum yields.

Objectives

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

Materials and methods

A field experiment was conducted in 2010 at Farmington, NM, to evaluate the response of grain sorghum (Pioneer DKS 53-67) and annual broadleaf weeds to preemergence followed by sequential early and late postemergence herbicides. Soils were a Doak silt loam with a pH of 7.4 and an organic matter content of less than 0.5%. 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 30-in. rows 30 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 35 psi. Grain sorghum was planted with flexi-planters equipped with disk openers on May 28. Preemergence treatments were applied on June 1 and immediately incorporated with 0.75 in. of sprinkler-applied water. Maximum and minimum soil temperatures during application were 81 and 65°F, respectively. Approximately 35 in. of sprinkler water were applied during the growing season. Early postemergence treatments were applied on June 30 when grain sorghum was in the V5 stage and weeds were less than 4 in. tall. Late postemergence treatments were applied on July 7 when grain sorghum was in stage 3 and weeds were less than 7 in. tall. Maximum and minimum air temperatures for early and late postemergence applications were 89 and 60°F and 83 and 54°F, respectively. Black nightshade and redroot and prostrate pigweed infestations were heavy, and common lambsquarters and Russian thistle infestations were moderate throughout the experimental area. Preemergence treatments were evaluated for crop injury and weed control on July 1. Early and late post emergence treatments were evaluated for crop injury and weed control on July 22. Grain sorghum was harvested on November 16 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 crop injury evaluations: Weed control and crop injury evaluations are given in Tables 7 and 8. There were no crop injury symptoms from any of the treatments for both rating periods. On July 1, the preemergence treatment of Roundup WeatherMAX plus Sharpen plus ammonium sulfate at 16 plus 2 oz/ac plus 2.8 lb/ac gave poor control of redroot and prostrate pigweed, black nightshade, Russian thistle, and common lambsquarters (Table 7). On July 22, the preemergence treatment of Roundup WeatherMAX plus Sharpen plus ammonium sulfate at 16 plus 2 oz/ac plus 2.8 lb/ac and the late postemergence treatment of Aim plus 2,4-D amine plus a nonionic surfactant and ammonium sulfate at 1 plus 6 plus 6 oz/ac plus 1 lb/ac gave poor control of redroot and prostrate pigweed, black nightshade, Russian thistle, and common lambsquarters (Table 8).

Crop yields: Yields are given in Table 8. Yields were 16 to 163 bu/ac higher in the herbicide-treated plots as compared to the weedy check.

Dow AgroSciences, Tansymustard Control in Winter Wheat

Introduction

Tansymustard is a troublesome weed in winter wheat. If not controlled, it can decrease wheat yields and interfere with harvest operations. Field trials were conducted to evaluate the control of tansymustard by selected herbicides in winter wheat.

Objectives

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

Materials and methods

A field experiment was conducted in 2010 at Farmington, NM, to evaluate the response of winter wheat and tansymustard to postemergence herbicides. Soils were a Wall sandy loam with less than 0.5% organic matter content. 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 35 psi. Winter wheat (var. 'Jagaline') was planted on 18-in. rows at 100 lb/ac with a Massey Ferguson grain drill on September 14. Eighteen-in. row spacings were used to ensure tansymustard pressure. Treatments were applied on March 23 prior to winter wheat's 6th Feekes growth stage. Maximum and minimum air temperatures during treatment application were 59 and 25°F, respectively. Other postemergence treatments were applied on April 26 after winter wheat was at approximately the 9th Feekes growth stage. Maximum and minimum air temperatures during treatment application were 69 and 40°F, respectively. On March 23 and April 26, tansymustard heights were less than 4 and greater than 8 in. Tansymustard infestation was heavy, with approximately 40 to 50 plants per square yard. Crop injury and weed control evaluations were made on April 26 and May 26. Winter wheat was harvested on August 10 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 crop injury evaluations: Results of crop injury and weed control evaluations are given in Tables 9 and 10. Harmony GT XP plus 2,4-D LV6 plus urea ammonium nitrate at 0.6 plus 4 plus 1,152 oz/ac had the highest injury rating of 5 (Tables 9 and 10). On April 26, all treatments except the weedy check and Puma and Axial applied at 10.5 and 16.4 oz/ac, respectively, gave excellent control of tansymustard (Table 9). On May 26, BASF 8100H and Banvel plus Harmony GT XP plus a nonionic surfactant applied late postemergence at 2.2 plus 2 oz/ac plus 5 oz/ac gave poor control of tansymustard (Table 10).

Crop yields: Results of yield are given in Table 10. Yields were 18 to 42 bu/ac higher in the herbicide-treated plots as compared to the weedy check.

DuPont Crop Protection, Cool-Season Native and Non-Native Grass Response to MAT-28

Introduction

In the San Juan Oil and Gas Producing Basin of northwest New Mexico, it is estimated that approximately 20,000 to 30,000 acres of disturbed lands created by oil and natural gas drilling will need to be re-vegetated during the next 10 years. Most herbicides used today injure grass seedlings during germination, which can hinder future replanting. A field trial was conducted to determine injury to seedlings and permanent grass stands when using MAT-28.

Objectives

- Determine stand establishment and yield of selected native and non-native cool-season grasses.

Materials and methods

A field experiment was conducted in 2009 and 2010 at Farmington, NM, to evaluate the response of selected native and non-native cool-season grasses to MAT-28. Soils were a Doak silt loam with a pH of 7.5 and an organic matter content of less than 0.5%. Soils were fertilized according to New Mexico State University recommendations based on soil tests. The experimental design was a split plot with rangeland grasses as whole plots and herbicide treatments as sub plots. Individual plots were 6 ft wide by 30 ft long. San Luis slender wheatgrass, Manchar smooth bromegrass, Rimrock Indian ricegrass, Hycrest crested wheatgrass, Oahe intermediate wheatgrass, Lune pubescent wheatgrass, Potomac orchardgrass, and Fawn tall fescue were planted on August 18, 2009, at 8, 8, 6, 8, 10, 9, 5, and 15 lb pure live seed (pls)/ac, respectively. MAT-28 was applied preemergence at 4 oz/ac on August 25, 2009, and immediately watered in with 0.75 in. of sprinkler-applied water. All other treatments were applied postemergence with a nonionic surfactant at 13 oz/ac on April 22, 2010. Maximum and minimum soil temperatures for the preemergence treatment were 94 and 72°F, respectively. Maximum and minimum air temperatures for the postemergence treatments were 52 and 35°F, respectively. Grass stand establishment ratings were made on July 7, 2010, and plots were harvested for yield on July 8. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Stand establishment evaluations: All grasses showed good to excellent tolerance to MAT-28 applied postemergence at 1 and 2 oz/ac (Table 11). All grasses, except Hycrest crested wheatgrass and Fawn tall fescue, showed excellent tolerance to MAT-28 plus Telar XP applied postemergence at 2.0 plus 0.5 oz/ac. MAT-28 plus Escort XP applied postemergence at 2.0 plus 0.33 oz/ac reduced Manchar smooth bromegrass and Fawn tall fescue stands to 56 and 57%, respectively. MAT-28 applied preemergence at 4.0 oz/ac severely reduced stands of San Luis slender wheatgrass, Manchar smooth bromegrass, and Fawn tall fescue (Table 11).

Grass yields: Grass yields are given in Table 12. The untreated plots and MAT-28 applied preemergence at 4.0 oz/ac had approximately 20 to 40% weed coverage when harvested (Table 12). Oahe intermediate wheatgrass, Fawn tall fescue, and Luna pubescent wheatgrass were the highest-yielding grasses (Table 12).

Dow AgroSciences, Cool-Season Native and Non-Native Grass Response to Milestone

Introduction

In the San Juan Oil and Gas Producing Basin of northwest New Mexico, it is estimated that approximately 20,000 to 30,000 acres of disturbed lands created by oil and natural gas drilling will need to be re-vegetated during the next 10 years. Most herbicides used today injure grass seedlings during germination, which can hinder future replanting. A field trial was conducted to determine timing of Milestone injury to seedlings.

Objectives

- Determine stand establishment and yield of selected native and non-native cool-season grasses.

Materials and methods

A field experiment was conducted in 2009 and 2010 at Farmington, NM, to evaluate the response of selected native and non-native cool-season grasses to Milestone. Soils were a Doak silt loam with a pH of 7.5 and an organic matter content of less than 0.5%. Soils were fertilized according to New Mexico State University recommendations based on soil tests. The experimental design was a split-split plot with rangeland grasses as whole plots, timing as sub plots, and herbicide treatments as sub-sub plots. Individual plots were 6 ft wide by 30 ft long. San Luis slender wheatgrass and Arriba western wheatgrass were planted on May 3, 2009, at 8 and 10 lb pls/ac, respectively. Milestone was applied on November 17, 2009, and February 16, March 1, and April 8, 2010, at 3, 7, and 14 oz/ac each day to different plots. Maximum and minimum soil temperatures from November 2009 and February, March, and April 2010 were 36 to 34, 37 to 32, 43 to 35, and 58 to 41°F, respectively. Grass stand establishment ratings were made on July 29, and plots were harvested for yield on October 5. Results obtained were subjected to analysis of variance at P = 0.05.

Results and discussion

Stand establishment evaluations: Stand establishment ratings are given in Table 13. Milestone applied at 7 and 14 oz/ac on April 8 resulted in severe crop injury to both grasses. Milestone applied at 14 oz/ac on April 8 had virtually no seedling emergence for either grass (Table 13).

Grass yields: Grass yields are given in Table 14. Milestone at 7 and 14 oz/ac applied on April 8 had a decrease in yield of 32.7 and 23.5, and 40.1 and 34.5 lb/plot, respectively, when compared to the overall average of 50 and 43 lb/plot for Arriba western wheatgrass and San Luis slender wheatgrass, respectively (Table 14).

NAPI, A Demonstration of Broadleaf Weed Control in Field Pumpkins with Preemergence Herbicides on the Navajo Agricultural Products Industry Farm

Introduction

Field pumpkin acreage on the Navajo Agricultural Products Industry (NAPI) farm was approximately 2,500 acres in 2010. These fields are irrigated by center pivot irrigation. Weeds like redroot and prostrate pigweed, Russian thistle, common lambsquarters, and black nightshade are troublesome weeds that can cause yield reductions and harvesting problems if left uncontrolled.

Objectives

- Determine efficacy of selected herbicides for control of broadleaf weeds in field pumpkins.

Materials and methods

A broadleaf weed control demonstration plot was conducted in 2010 on NAPI field 8-46B. Demonstration plots were 24 ft wide by 100 ft long. All treatments were applied preemergence on May 19, approximately 4 days after planting. Treatments were incorporated on May 20 by applying 0.5 in. of center pivot-applied irrigation water. Maximum and minimum soil temperatures during application were 71 and 60°F, respectively. These fields were then evaluated by Mr. Leon Notah on June 14.

Results and discussion

Weed control and crop injury evaluations: No injury was observed from any of the treatments. All treatments except the check gave good to excellent control of redroot and prostrate pigweed (Table 15). Sandea at 0.75 oz/ac and Sonalan HFP alone or in combination with Sandea applied at 48 and 48 plus 0.75 oz/ac gave poor control of black nightshade. Russian thistle control was poor with Dual Mag, Outlook, Sandea, and the combination of Sandea plus Sonalan HFP applied at 16, 13, 0.75, and 0.75 plus 48 oz/ac, respectively. Sonolan HFP applied at 48 oz/ac and Sandea applied at 0.75 oz/ac alone or in combination with Sonolan at 48 oz/ac gave poor control of black nightshade and Russian thistle. Dual Mag and Outlook applied at 16 and 13 oz/ac gave poor control of Russian thistle (Table 15).

NAPI, A Demonstration of Broadleaf Weed Control in Dry Beans with Preemergence Herbicides on the Navajo Agricultural Products Industry Farm

Introduction

Dry bean acreage on the NAPI farm was approximately 12,500 acres in 2010. These fields are irrigated by center pivot irrigation. Weeds like redroot and prostrate pigweed, Russian thistle, common lambsquarters, and black nightshade are troublesome weeds that can cause yield reductions and harvesting problems if left uncontrolled.

Objectives

- Determine efficacy of selected herbicides for control of broadleaf weeds in dry beans.

Materials and methods

A broadleaf weed control demonstration plot was conducted in 2010 on NAPI field 2-12. Demonstration plots were 24 ft wide by 100 ft long. All treatments were applied preemergence on June 3, approximately 3 days after planting. Treatments were incorporated on June 4 by applying 0.5 in. of center pivot-applied irrigation water. Maximum and minimum soil temperatures during application were 81 and 67°F, respectively.

Results and discussion

Weed control and crop injury evaluations: No injury was observed from any of the treatments. All treatments except the check gave excellent control of redroot and prostrate pigweed, black nightshade, and common lambsquarters (Table 16). Russian thistle control was poor with Dual Mag and Outlook applied at 21 oz/ac.

Table 1. Control of Annual Broadleaf Weeds with Preemergence Herbicides in Field Corn on June 10; NMSU Agricultural Science Center at Farmington, NM, 2010

		Stand	Crop	Weed Control[a,b]				
	Rate	Count	Injury[a]	Amare	Amabl	Solni	Saskr	Cheal
Treatments	(oz/ac)	(no.)	(%)	(%)				
Integrity	10	24	0	100	100	100	100	100
Lumax	64	23	0	100	100	100	100	100
Corvus	3.3	23	0	100	100	100	100	100
Balance Flexx + atrazine	3 + 32	24	0	100	100	100	100	100
Sharpen + Harness Xtra	2 + 48	23	0	100	100	100	100	100
Harness Xtra	48	24	0	100	100	100	100	100
Integrity	13	23	0	100	100	100	73	100
Corvus	5.6	23	0	100	100	100	100	100
Balance Flexx	5	24	0	100	100	100	100	100
Weedy check		23	0	0	0	0	0	0
LSD 0.05		ns		1	1	1	1	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 2. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Late Postemergence Herbicides in Field Corn on July 7; NMSU Agricultural Science Center at Farmington, NM, 2010

		Weed Control[c,d]					
	Rate	Amare	Amabl	Solni	Saskr	Cheal	Yield
Treatments[a]	(oz/ac)	(%)					(bu/ac)
Integrity/Roundup PowerMAX[b]	10/22	100	100	100	100	100	262
Lumax/Roundup PowerMAX[b]	64/22	100	100	100	100	100	258
Corvus/Roundup PowerMAX[b]	3.3/22	100	100	100	100	100	279
Balance Flexx + atrazine/Roundup PowerMAX[b]	3 + 32/22	100	100	100	100	100	267
Sharpen + Harness Xtra/Roundup PowerMAX[b]	2 + 48/22	100	100	100	100	100	264
Harness Xtra/Roundup PowerMAX[b]	48/22	100	100	100	100	100	279
Integrity/Status + Roundup PowerMAX[b]	10/2.5 + 22	100	100	100	100	100	276
Integrity	13	100	100	100	78	100	262
Corvus	5.6	100	100	100	100	100	260
Balance Flexx	5.0	100	100	100	100	100	249
Lumax	64	100	100	100	100	100	257
Weedy check		0	0	0	0	0	72
LSD 0.05		1	1	1	1	1	33

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

[b]Treatments applied with a nonionic surfactant and/or ammonium sulfate at 10 oz and 5 lb/ac, respectively.

[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 3. Control of Annual Broadleaf Weeds with Preemergence Herbicides in Field Corn on June 28 and July 7; NMSU Agricultural Science Center at Farmington, NM, 2010

Treatments[a]	Rate (oz/ac unless otherwise noted)	Stand Count (no.)	Crop Injury[b] (%)	Weed Control[b,c] (%) Amare	Amabl	Solni	Saskr	Cheal	Yield (bu/ac)
Ignite 280 + ammonium sulfate	22 + 5 lb/ac	23	0	78	81	73	65	78	236
Ignite 280 + ammonium sulfate	29 + 5 lb/ac	24	0	83	91	93	95	86	259
Ignite 280 + ammonium sulfate	36 + 5 lb/ac	24	0	83	90	96	92	73	243
Ignite 280 + ammonium sulfate/Ignite 280 + ammonium sulfatea	22 + 5 lb/ac/22 + 5 lb/ac	23	0	93/97	92/96	88/96	63/96	94/95	261
Ignite 280 + Coron	22 + 128	23	0	94	95	63	66	86	252
Ignite 280 + urea ammonium nitrate solution	22 + 64	23	0	95	93	96	26	71	245
Ignite 280 + Capreno + atrazine + ammonium sulfate	22 + 2 + 32 + 5 lb/ac	25	0	100	100	100	100	100	266
Ignite 280 + Laudis + atrazine + Coron	22 + 2 + 32 + 128	24	0	100	100	100	100	100	266
Ignite 280 + Laudis + atrazine + ammonium sulfate	22 + 2 + 32 + 5 lb/ac	23	0	100	100	100	100	100	256
Ignite 280 + Laudis + atrazine + Coron + ammonium sulfate	22 + 2 + 32 + 128 + 5 lb/ac	24	0	100	100	100	100	100	258
Roundup PowerMax + ammonium sulfate	22 + 5 lb/ac	24	0	98	98	93	58	96	247
Roundup PowerMax + Ignite 280 + ammonium sulfate	22 + 22 + 5 lb/ac	24	0	93	97	99	92	51	255
Roundup PowerMax + Ignite 280 + Coron	22 + 22 + 128	23	0	98	98	99	78	88	246
Ignite 280 + N-PACT	22 + 128	24	0	90	94	97	93	73	243
Cadet + Roundup PowerMax + nonionic surfactant	0.5 + 22 + 10	25	0	60	90	55	78	48	239
Weedy check		24	0	0	0	0	0	0	77
LSD 0.05			ns	4	3	5	4	3	29

[a]First treatment applied early postemergence and evaluated on June 28, then a slash followed by a sequential late postemergence treatment evaluated on July 7.

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

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

Table 4. Control of Annual Broadleaf Weeds with Preemergence Herbicides in Field Corn on June 8; NMSU Agricultural Science Center at Farmington, NM, 2010

Treatments	Rate (oz/ac)	Stand Count (no.)	Crop Injury[a] (%)	Weed Control[a,b] (%) Amare	Amabl	Solni	Saskr	Cheal
Corvus + atrazine	5.6 + 32	24	0	100	100	100	100	100
Balance Flexx + atrazine	6 + 32	23	0	100	100	100	100	100
Corvus	3	24	0	100	100	100	100	100
Balance Flexx	6	24	0	100	100	100	100	100
Balance Flexx	3	24	0	100	100	100	100	100
DPX E9636 + DPXYl671-010	0.669 + 0.446	25	0	100	100	100	98	100
DPX E9636 + DPXYl671-010	0.801 + 0.53	24	0	100	100	100	100	100
DPX E9636 + DPXYl671-010	1 + 0.66	23	0	100	100	100	98	100
Weedy check		24	0	0	0	0	0	0
LSD 0.05		ns		1	1	1	1	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 5. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence Herbicides in Field Corn on June 28; NMSU Agricultural Science Cener at Farmington, NM, 2010

		Weed Control[g,h]					
	Rate	Amare	Amabl	Solni	Saskr	Cheal	Yield
Treatments[a]	(oz/ac)	(%)					(bu/ac)
Corvus + atrazine	5.6 + 32	100	100	100	100	100	258
Balance Flexx + atrazine	6 + 32	100	100	100	100	100	252
Corvus + atrazine[b]	5.6 + 32	100	100	100	100	100	256
Balance Flexx + atrazine[b]	6 + 32	99	100	100	99	100	256
Capreno + Roundup PowerMAX[b,d]	3 + 11	100	100	100	73	100	253
Capreno + Roundup PowerMAX[c,d]	3 + 11	100	100	100	66	100	251
Corvus/Laudis + Roundup PowerMAX[c,e]	3/3 + 11	100	100	100	100	100	256
Balance Flexx/Laudis + Roundup PowerMAX[c,e]	6/3 + 11	100	100	100	100	100	259
Corvus/Ignite 280 + Laudis[c]	3/22 + 2	100	100	100	100	100	252
Balance Flexx/Ignite 280 + Laudis[c]	2/22 + 2	100	100	100	100	100	252
Balance Flexx/Capreno + Roundup PowerMAX[c,d]	3/3 + 11	100	100	100	100	100	258
DPX E9636 + DPXYl671-010/Roundup PowerMAX[c,f]	0.669 + 0.446/22	98	100	100	98	100	247
DPX E9636 + DPXYl671-010/Roundup PowerMAX[c,f]	0.801 + 0.53/22	99	100	100	99	100	248
DPX E9636 + DPXYl671-010/Roundup PowerMAX[c,f]	1 + 0.66/22	99	100	100	98	100	268
Resolve Q + Roundup PowerMAX[c,f]	1.25 + 22	100	100	100	46	100	245
Weedy check		0	0	0	0	0	79
LSD 0.05		1	1	1	2	1	26

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

[b]Treatments applied postemergence on June 1.

[c]Treatments applied postemergence on June 8.

[d]Treatments applied with a crop oil concentrate at 16 oz/ac.

[e]Treatments applied with a methylated seed oil at 16 oz/ac.

[f]Treatments applied with ammonium sulfate at 2 lb/ac.

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

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

Table 6. Yield of Field Corn from Microbes Applied Either Preemergence or Preemergence Followed by a Sequential Postemergence Treatment on November 22; NMSU Agricultural Science Center at Farmington, NM, 2010

	Rate	Yield
Treatments[a]	(oz/ac)	(bu/ac)
Microbial Energy	256	221
Microbial Energy	512	230
Microbial Energy	768	239
Microbial Energy	1024	234
Microbial Energy/Microbial Energy	128/128	200
Microbial Energy/Microbial Energy	256/256	221
Microbial Energy/Microbial Energy	384/384	217
Microbial Energy/Microbial Energy	512/512	225
Quantum VS + Inoculaid Light	16 + 16	194
Quantum VS + Inoculaid Light	32 + 32	227
Quantum VS + Inoculaid Light	128 + 32	225
Quantum VS + Inoculaid Light/Quantum VS + Inoculaid Light	8 + 8/8 + 8	220
Quantum VS + Inoculaid Light/Quantum VS + Inoculaid Light	16 + 16/16 + 16	234
Quantum VS + Inoculaid Light/Quantum VS + Inoculaid Light	64 + 64/64 + 16	226
Quantum VS + Inoculaid Light/Quantum VS + Inoculaid Light	64 + 8/64 + 8	224
Untreated check		233
LSD 0.05		ns

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

Table 7. Control of Annual Broadleaf Weeds with Preemergence Herbicides in Grain Sorghum on July 1; NMSU Agricultural Science Center at Farmington, NM, 2010

Treatments	Rate (oz/ac)	Crop Injury[b] (%)	Weed Control[b,c] (%) Amare	Amabl	Solni	Saskr	Cheal
Roundup WeatherMAX + Sharpen[a]	16 + 2	0	30	35	45	33	55
Guardsman Max	48	0	100	100	100	100	100
Weedy check		0	0	0	0	0	0
LSD 0.05			6	6	5	12	5

[a]Treatment applied with ammonium sulfate at 2.8 lb/ac.

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

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

Table 8. Control of Annual Broadleaf Weeds with Preemergence Followed by Early and Late Postemergence Herbicides in Grain Sorghum on July 22; NMSU Agricultural Science Center at Farmington, NM, 2010

Treatments[a]	Rate (oz/ac)	Crop Injury[f] (%)	Weed Control[f,g] (%) Amare	Amabl	Solni	Saskr	Cheal	Yield (bu/ac)
Roundup WeatherMAX + Sharpen[d]	16 + 2	0	25	31	41	30	41	28
Huskie + atrazine[b,d]	13 + 16	0	100	100	100	100	100	161
Huskie + atrazine[b,d]	16 + 16	0	100	100	100	100	100	163
Huskie + atrazine + 2,4-D ester[b,d]	13 + 16 + 4	0	100	100	100	100	100	175
Huskie + atrazine + Banvel[b,d]	13 + 16 + 4	0	100	100	100	100	100	147
Atrazine + Buctril[b]	16 + 16	0	100	100	100	100	100	159
Aim + 2,4-D amine[b,e]	1 + 6	0	98	98	92	86	90	71
Huskie + atrazine[b,d]/Huskie + atrazine[c,d]	13 + 16/13 + 16	0	100	100	100	100	100	159
Huskie + atrazine[c,d]	13 + 16	0	100	100	100	100	100	164
Huskie + atrazine[c,d]	16 + 16	0	100	100	100	100	100	151
Huskie + atrazine + 2,4-D ester[c,d]	13 + 16 + 4	0	100	100	100	100	100	134
Huskie + atrazine + Banvel[c,d]	13 + 16 + 4	0	100	100	100	100	100	133
Atrazine + Buctril[c]	16 + 16	0	90	90	95	93	93	126
Aim + 2,4-D amine[c,e]	1 + 6 + 6	0	21	25	28	36	28	51
Guardsman Max/Huskie[c,d]	48/13	0	100	100	100	100	100	163
Weedy check			0	0	0	0	0	12
LSD 0.05			2	2	3	3	3	33

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

[b]Treatments applied early postemergence on June 30.

[c]Treatments applied late postemergence on July 6.

[d]Treatments applied with ammonium sulfate at 1 lb/ac.

[e]Treatments applied with a nonionic surfactant at 6 oz/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 9. Control of Tansymustard in 'Jagaline' Winter Wheat on April 26; NMSU Agricultural Science Center at Farmington, NM, 2010

Treatments	Rate (oz/ac)	Crop Injury[h] (%)	Weed Control[h,i] DESPI (%)
BASF 8100H + Harmony GT XP[a]	4.4 + 0.3	0	100
Banvel + Harmony GT XP[a]	4 + 0.3	0	99
Proxsulam + cloquintocet[a,g]	6.75	0	98
Proxsulam + cloquintocet[a,b,g]	6.75	0	100
Proxsulam + cloquintocet[a,c,g]	6.75	0	99
Osprey[a,b]	4.76	0	100
Puma	10.5	0	72
Axial	16.4	0	83
Harmony GT XP + 2,4-D ester[a]	0.6 + 6	0	100
Harmony GT XP + 2,4-D ester[d]	0.6 + 6	0	100
Harmony GT XP + 2,4-D ester[e]	0.6 + 4	0	100
Harmony GT XP + 2,4-D ester[f]	0.6 + 4	5	100
Weedy check		0	0
LSD 0.05			7

[a]Treatments applied with a nonionic surfactant at 5 oz/ac.

[b]Treatment applied with ammonium sulfate at 1.5 lb/ac.

[c]Treatment applied with a crop oil concentrate at 16 oz/ac.

[d]Treatments applied with urea ammonium nitrate solution (32-0-0) at 384 oz/ac.

[e]Treatments applied with urea ammonium nitrate solution (32-0-0) at 768 oz/ac.

[f]Treatments applied with urea ammonium nitrate solution (32-0-0) at 1,152 oz/ac.

[g]Proxsulam + cloquintocet is a package mix.

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

[i]DESPI = tansymustard.

Table 10. Control of Tansymustard in 'Jagaline' Winter Wheat on May 26; NMSU Agricultural Science Center at Farmington, NM, 2010

Treatments	Rate (oz/ac)	Crop Injury[h] (%)	Weed Control[h,i] DESPI (%)	Yield (bu/ac)
BASF 8199H + Harmony GT XP[a]	4.4 + 0.3	0	95	64
Banvel + Harmony GT XP[a]	4 + 0.3	0	92	62
BASF 8100H + Harmony GT XP[a,j]	2.2 + 0.6	0	63	52
Banvel + Harmony GT XP[a,j]	2 + 0.6	0	68	49
Proxsulam + cloquintocet[a,g]	6.75	0	98	69
Proxsulam + cloquintocet[a,b,g]	6.75	0	99	68
Proxsulam + cloquintocet[a,c,g]	6.75	0	93	66
Osprey[a,b]	4.76	0	95	62
Puma	10.5	0	33	49
Axial	16.4	0	30	51
Harmony GT XP + 2,4-D ester[a]	0.6 + 6	0	100	68
Harmony GT XP + 2,4-D ester[d]	0.6 + 6	0	99	70
Harmony GT XP + 2,4-D ester[e]	0.6 + 4	0	100	73
Harmony GT XP + 2,4-D ester[f]	0.6 + 4	5	96	66
Weedy check		0	0	31
LSD 0.05			3	10

[a]Treatments applied with a nonionic surfactant at 5 oz/ac.

[b]Treatment applied with ammonium sulfate at 1.5 lb/ac.

[c]Treatment applied with a crop oil concentrate at 16 oz/ac.

[d]Treatments applied with urea ammonium nitrate solution (32-0-0) at 384 oz/ac.

[e]Treatments applied with urea ammonium nitrate solution (32-0-0) at 768 oz/ac.

[f]Treatments applied with urea ammonium nitrate solution (32-0-0) at 1,152 oz/ac.

[g]Proxsulam + cloquintocet is a package mix.

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

[i]DESPI = tansymustard.

[j]Treatments applied on April 26.

Table 11. Percent Stand Establishment Ratings of Grasses Under MAT-28 Alone or in Combination on July 7; NMSU Agricultural Science Center at Farmington, NM, 2010

		Stand establishment ratings[d]								Herbicide
	Rate	SLSW	MSM	RIR	HCCW	OIW	LPW	POG	FTF	means[c]
Treatments	(oz/ac)	(%)								
treatment										
MAT-28[a]	1.0	97	94	100	85	100	100	100	100	96a
MAT-28[a]	2.0	95	95	100	83	97	97	100	100	95b
MAT-28[a]	4.0	68	73	93	77	95	93	97	97	86e
MAT-28 + Telar[a]	2.0 + 0.5	99	97	95	70	100	100	100	73	92c
MAT-28 + Escort XP[a]	2.0 + 0.33	95	56	97	83	90	100	100	57	89d
MAT-28[b]	4.0	5	47	65	80	90	87	95	20	61f
Milestone[a]	7.0	95	100	57	67	100	97	100	100	89d
Untreated		100	100	100	100	100	100	100	100	100a
Grass treatment means[c]		81c	87b	88b	80c	96a	96a	99a	81c	

[a]Treatments applied with a nonionic surfactant at 22 oz/ac.

[b]Treatment applied preemergence on August 25, 2009.

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

[d]SLSW = San Luis slender wheatgrass, MSM= Manchar smooth bromegrass, RIR = Rimrock Indian ricegrass, HCCW = Hycrest crested wheatgrass, OIW = Oahe intermediate wheatgrass, LPW = Luna pubescent wheatgrass, POG = Potomac orchardgrass, and FTF = Fawn tall fescue.

Table 12. Yield of Grasses Under MAT-28 Alone or in Combination on July 8; NMSU Agricultural Science Center at Farmington, NM, 2010

Treatments	Rate (oz/ac)	Yield (lb/plot)[d] SLSW	MSM	RIR	HCCW	OIW	LPW	POG	FTF	Herbicide means[c] treatment
MAT-28[a]	1.0	21.6	22.1	27.9	25.4	67.6	34.8	25.2	46.9	34d
MAT-28[a]	2.0	18.0	28.6	26.1	24.8	62.1	29.3	27.4	43.3	32d,e
MAT-28[a]	4.0	19.4	23.7	23.6	21.3	60.6	27.2	36.9	42.5	32d,e
MAT-28 + Telar[a]	2.0 + 0.5	26.0	48.0	29.5	24.6	82.8	37	40.1	37.8	41b
MAT-28 + Escort XP[a]	2.0 + 0.33	28.7	42.4	26.5	28.6	43.3	52.6	38.9	34.4	37c
MAT-28[b]	4.0	16.9	14.9	31.9	34.8	50.1	32.9	21.5	38.3	30e
Milestone[a]	7.0	14.6	47.8	18.6	23.8	87.9	52.0	42.0	60.5	42b
Untreated		38.4	48.2	27.9	45.4	87.9	43.7	31.9	36.3	45a
Grass treatment means[c]		23f	34d	27e	29e	66a	39c	33d	43b	

[a]Treatments applied with a nonionic surfactant at 22 oz/ac.

[b]Treatment applied preemergence on August 25, 2009.

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

[d]SLSW = San Luis slender wheatgrass, MSM= Manchar smooth bromegrass, RIR = Rimrock Indian ricegrass, HCCW = Hycrest crested wheatgrass, OIW = Oahe intermediate wheatgrass, LPW = Luna pubescent wheatgrass, POG = Potomac orchardgrass, and FTF = Fawn tall fescue.

Table 13. Percent Stand Establishment Ratings of Grasses Under Milestone Applied at Different Timings on July 29; NMSU Agricultural Science Center at Farmington, NM, 2010

Treatments	Rate (oz/ac)	Timing	Stand establishment[a] AWWG (%)	SLSW (%)
Milestone	3.0	November 17, 2009	100	100
		February 16, 2010	100	100
		March 1, 2010	100	100
		April 8, 2010	100	100
Milestone	7.0	November 17, 2009	100	100
		February 16, 2010	100	100
		March 1, 2010	100	100
		April 8, 2010	47	22
Milestone	14.0	November 17, 2009	100	100
		February 16, 2010	100	100
		March 1, 2010	100	100
		April 8, 2010	2	2
Untreated		November 17, 2009	100	100
		February 16, 2010	100	100
		March 1, 2010	100	100
		April 8, 2010	100	100
Mean LSD for timing at 0.05[b]		November 17, 2009	100a	
		February 16, 2010	100a	
		March 1, 2010	100a	
		April 8, 2010	59b	
Mean LSD for treatment at 0.05[b]		Milestone 3.0 oz/ac	100a	
		Milestone 7.0 oz/ac	83b	
		Milestone 14.0 oz/ac	76c	
		Untreated	100a	

[a]AWWG = Arriba western wheatgrass and SLSW = San Luis slender wheatgrass.

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

Table 14. Yield of Grass Under Milestone on October 5; NMSU Agricultural Science Center at Farmington, NM, 2010

Treatments	Rate (oz/ac)	Timing	Yield (lb/plot)[a] AWWG	SLSW
Milestone	3.0	November 17, 2009	55.1	48.0
		February 16, 2010	55.7	48.1
		March 1, 2010	56.4	49.0
		April 8, 2010	53.3	33.4
Milestone	7.0	November 17, 2009	51.4	52.0
		February 16, 2010	64.2	51.3
		March 1, 2010	70.2	48.5
		April 8, 2010	17.3	19.5
Milestone	14.0	November 17, 2009	48.7	52.7
		February 16, 2010	55.9	47.0
		March 1, 2010	58.0	43.6
		April 8, 2010	9.9	8.5
Untreated		November 17, 2009	56.0	48.8
		February 16, 2010	54.0	52.4
		March 1, 2010	51.0	47.9
		April 8. 2010	54.1	48.4
Mean LSD for timing at 0.05[b]		November 17, 2009	51.6a	
		February 16, 2010	53.6a	
		March 1, 2010	53.1a	
		April 8, 2010	30.5b	
Mean LSD for treatment at 0.05[b]		Milestone 3.0 oz/ac	49.9a	
		Milestone 7.0 oz/ac	46.8b	
		Milestone 14.0 oz/ac	40.5c	
		Untreated	51.6a	

[a]AWWG = Arriba western wheatgrass and SLSW = San Luis slender wheatgrass.

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

Table 15. Broadleaf Weed Control in Field Pumpkins on NAPI Field 8-46B on June 14, 2010

Treatments	Rate (oz/ac)	Weed Control[a,b] (%) Amare	Amabl	Solni	Saskr	Cheal
Dual Mag	16	100	96	85	55	100
Outlook	13	100	98	92	55	100
Sonalan HFP	48	90	88	75	80	88
Dual Mag + Sonalan HFP	16 + 48	98	100	90	82	98
Outlook + Sonalan HFP	13 + 48	100	100	88	80	98
Sandea	0.75	98	92	75	60	85
Sandea + Sonalan HFP	0.75 + 48	96	88	72	55	98
Sandea + Dual Mag	0.75 + 16	100	100	86	85	98
Sandea + Outlook	0.75 + 13	100	100	88	86	98
Weedy check		0	0	0	0	0

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

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

Table 16. Broadleaf Weed Control in Dry Beans on NAPI field 2-12 on June 29, 2010

		Weed Control[a,b]				
	Rate	Amare	Amabl	Solni	Saskr	Cheal
Treatments	(oz/ac)	(%)				
Dual Mag	21	100	100	96	55	100
Outlook	21	100	100	98	55	100
Valor	1.5	100	100	98	98	100
Dual Mag + Valor	16 + 0.75	100	100	100	100	100
Outlook + Valor	16 + 0.75	100	100	100	100	100
Weedy check		0	0	0	0	0

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

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

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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.

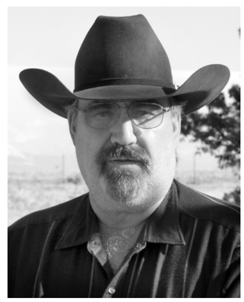
Massinga, R.A., R.S. Currie, and T.P. Trooien. 2003. Water use and light interception under Palmer amaranth (*Amaranthus palmeri*) and corn competition. *Weed Science, 51*, 523–531.

National Academy of Sciences. 1969. Insect-pest management and control. *Principles of plant and animal pest control series*. Vol.3.

New Mexico Agricultural Statistics. 2007. United States Department of Agriculture and New Mexico Agricultural Statistics Service, Las Cruces, NM.

Peairs, F.B., L. Brooks, G. Hein, G. Johnson, B. Massey, D. McBride, P. Morrison, J.T. Schultz, and E. Spackman. 1989. *Economic impact of the Russian wheat aphid in the western United States: 198701988*. A report by the Russian Wheat Aphid Investigative committee to the Great Plains Agricultural Council (F. Peairs, Chairman, December 1989. Great Plains Agricultural Council Publ. No. 129.

Richardson, L. 1986. Agrichemical anomie: Why it won't go away, *In Proc. Western Soc. Weed Sci.*, pp. 3-4, San Diego, CA. March 18-20, 1986.



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