Pest Control in Crops Grown in Northwestern New Mexico, 2007

Annual Data Report 100-2007

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

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INTRODUCTION

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

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

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

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

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

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

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

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Bayer CropScience, broadleaf weed control in field corn with preemergence and preemergence followed by sequential postemergence treatments of Laudis

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 tolerance to applied selected herbicides and yield.

Materials and methods
A field experiment was conducted in 2007 at Farmington, NM, to evaluate the response of field corn (var. Pioneer 34N45) and annual broadleaf weeds to preemergence and preemergence followed by sequential postemergence herbicides. Soils were fertilized according to New Mexico State University recommendations based on soil tests. The experimental design was a randomized complete block with four replications. Individual plots were four 34-in. rows 30 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 35 psi. Field corn was planted with flexi-planters equipped with disk openers on May 15. The preemergence treatments were applied on May 16 and immediately incorporated with 0.75 in. of sprinkler-applied water. Sequential postemergence treatments were applied on June 12 when field corn was in the 4th leaf stage. Late postemergence treatments were applied on June 26 when field corn was in the 6th to 8th leaf stage. Black nightshade and redroot and prostrate pigweed infestations were heavy and Russian thistle and common lambsquarters infestations were light throughout the experimental area. Preemergence treatments and crop injury were evaluated visually on June 11 and July 16. Postemergence treatments and crop injury were evaluated visually on July 16. Stand counts were made on June 12 and July 16 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 injury evaluations: Crop injury evaluations and stand counts are given in Table 1. Weed control evaluations are given in Tables 1 and 2. Balance Pro and Sequence applied preemergence at 0.03 and 1.75 lb ai/ac injured corn 95 and 33%, respectively (Table 1). All preemergence treatments gave good to excellent control of broadleaf weeds except the weedy check (Table 1).In July, all postemergence treatments gave good to excellent control of broadleaf weeds except the weedy check (Table 2). It was also noted that in some plots with Laudis applied at 0.08 or 0.05 lb ai/ac, either early or late postemergence gave excellent control of common cocklebur (data not shown).

Crop yields: Yields are given in Table 2. Yields were 96 to 156 bu/ac higher in herbicide-treated plots as compared to the check, except for Balance Pro applied preemergence at 0.03 lb ai/ac followed by a sequential postemergence treatment of Laudis plus AAtrex at 0.08 plus 0.5 lb ai/ac. Approximately 3 bu/ac of corn were harvested from this treatment (Table 2).

Syngenta Crop Protection, broadleaf weed control in field corn with preemergence followed by sequential postemergence treatments

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 tolerance to applied selected herbicides and yield.

Materials and methods
A field experiment was conducted in 2007 at Farmington, NM, to evaluate the response of field corn (Pioneer 34N45) and annual broadleaf weeds to preemergence followed by sequential postemergence herbicides. Soils were fertilized according to New Mexico State University recommendations based on soil tests. The experimental design was a randomized complete block with 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 15. Preemergence herbicides were applied on May 16 and immediately incorporated with 0.75 in. of sprinkler-applied water. Postemergence treatments were applied on June 12 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 11 and July 16, respectively. Crop injury was evaluated on June 11. Stand counts were made on June 11 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 injury evaluations: Weed control and crop injury evaluations are given in Tables 3 and 4. Stand counts are given in Table 3. Guardsman Max Lite applied preemergence at 1.25 lb ai/ac had the highest injury rating of 5. The preemergence treatments gave 86% or better control of redroot and prostrate pigweed, black nightshade, and common lambsquarters. Russian thistle control was poor with Dual II Mag (Table 3). In July, Dual II Mag applied preemergence at 1.3 lb ai/ac followed by a sequential postemergence treatment of Touchdown HiTech at 0.75 lb ai/ac increased Russian thistle control by approximately 44%. Sequence applied postemergence at 1.65 lb ai/ac gave good control of redroot and prostrate pigweed, black nightshade, and common lambsquarters and poor control of Russian thistle. Touchdown HiTech applied postemergence at 0.75 lb ai/ac gave good control of black nightshade and common lambsquarters and poor control of redroot and prostrate pigweed and Russian thistle (Table 4).

Crop yields: Yields are given in Table 4. Yields were 98 to 144 bu/ac higher in herbicide-treated plots as compared to the check.

Broadleaf weed control in dry beans

Introduction

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

Objectives

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

Materials and methods

A field experiment was conducted in 2007 at Farmington, NM, to evaluate the response of dry edible beans (var. Bill Z) and annual broadleaf weeds to preemergence and preemergence followed by sequential postemergence herbicides. Soils were fertilized according to New Mexico State University recommendations based on soil tests. The experimental design was a randomized complete block with four replications. Individual plots were four 34-in. rows 30 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 35 psi. Dry beans were planted with flexi-planters on May 29. Preemergence treatments were applied on May 31 and immediately incorporated with 0.75 in. of sprinkler-applied water. Sequential postemergence treatments were applied on June 27 after cultivation and when dry beans were in the fourth trifoliolate leaf stage and weeds were small (<2 in.). Black nightshade and redroot and prostrate pigweed infestations were heavy, common lambsquarters infestations were moderate, and Russian thistle infestations were light throughout the experimental area. Crop injury and weed control evaluations were made on June 27. Preemergence followed by sequential postemergence treatments were evaluated on July 30. Dry beans were hand harvested on September 5 and left in the field until September 11 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 5 and 6. Only Valor and Outlook in combination with Prowl H_2O at 0.05, 0.56, and 0.8 lb ai/ac, respectively, showed injury symptoms of <2% (data not shown). All treatments gave excellent control of redroot and prostrate pigweed, common lambsquarters, and black nightshade. Russian thistle control was poor with those preemergence treatments containing Outlook, Prowl, and Prowl H_2O, regardless of rate and combination. Valor applied preemergence at 0.05 lb ai/ac or in combination with Prowl or Prowl H_2O at 0.8 lb ai/ac gave excellent control of Russian thistle (Table 5). All treatments gave 86% or better control of redroot and prostrate pigweed, common lambsquarters, and black nightshade. Russian thistle control increased significantly when Raptor plus Basagran at 0.032 plus 0.25 lb ai/ac was included as a sequential postemergence treatment to preemergence treatments of Outlook, Prowl, and Prowl H_2O (Table 6).

Crop yields: Yields are given in Table 6. Yields were 2,575 to 3,843 lb/ac higher in the herbicide-treated plots as compared to the check.

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. The sunflower is adapted for oil seed production where corn is successful in the northern two-thirds of the U.S. Little information is available for 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 yield.

Materials and methods

A field experiment was conducted in 2007 at Farmington, NM, to evaluate the response of Express- (tribenuron) tolerant sunflowers (var. Pioneer 63N81) and annual broadleaf weeds to preemergence followed by sequential postemergence applications of Express. Sunflowers were planted on June 4 with flexi-planters equipped with disk openers. Soils were fertilized according to New Mexico State University recommendations based on soil tests. Plots were four 34-in. rows 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 5 and immediately incorporated with 0.75 in. of sprinkler-applied water. Postemergence treatments were applied on June 27 when sunflowers were in the 3rd to 4th leaf stage and weeds were <4 in. tall. Preemergence treatments were evaluated for crop injury and weed control on June 27, and sequential postemergence treatments were evaluated for crop injury and weed control on July 26. Postemergence treatments of Express were also applied on June 27 and evaluated for crop injury and weed control on July 26. 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 26 by combining the center two rows of each plot using a John Deere 3300 combine equipped with a load cell.

Results and discussion

Weed control and injury evaluations: Crop injury evaluations are given in Table 7. Weed control evaluations are given in Tables 7 and 8. Spartan and Outlook applied at 0.14 and 0.56 lb ai/ac were the only preemergence treatments that showed any crop injury (Table 7). No crop injury was noted from any of the postemergence treatments of Express. All treatments gave excellent control of black nightshade and common lambsquarters. All treatments gave excellent control of redroot and prostrate pigweed except Prowl applied at 0.8 lb ai/ac and the weedy check (Table 7). Spartan applied preemergence at 0.14 lb ai/ac gave excellent control of Russian thistle. The preemergence treatments of Prowl at 0.8 lb ai/ac followed by a sequential postemergence treatment of Express at either 0.008 or 0.015 lb ai/ac increased redroot and prostrate pigweed and Russian thistle control from 28 to 34%, respectively (Table 8). Postemergence treatments of Express at 0.008, 0.015, and 0.024 lb ai/ac gave poor control of redroot and prostrate pigweed. Express at 0.008, 0.015, and 0.024 lb ai/ac gave good to excellent control of common lambsquarters (Table 8).

Crop yields: Crop yields are given in Table 8. Yields were 1,716 to 2,196 lb/ac higher in the herbicide-treated plots as compared to the weedy check.

Russian thistle and kochia control in OP 367 hybrid poplar trees on the Navajo Agricultural Products Industry poplar tree farm

Introduction

Hybrid poplar has been recognized as one of the fastest growing temperate tree species in North America. The Navajo Agricultural Products Industry (NAPI) has poplar trees that are approximately two to three years old. Weeds, especially Russian thistle and kochia, cause significant problems by interfering with the drip system and depleting the soil system of nutrients that could otherwise be used by the poplar trees.

Objectives

- Determine efficacy of selected herbicides for control of Russian thistle and kochia on the NAPI poplar tree farm and hybrid poplar injury.

Materials and methods

OP 367 hybrid poplar tree sprigs were planted approximately in the spring of 2004. Sprigs were approximately 9 in. in length and planted to a depth of 7 in. The field was fertilized, disked and leveled before sprigs were planted. Sprigs were planted on a 12 by 12 spacing. Drip tape with dripper spacing of 3 ft was laid out on both sides of the sprigs at a distance of 1 ft. Individual plots were 10 ft wide by 25 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 35 psi. Fall treatments were applied on November 20, 2006. No weeds were present when treatments were applied. Poplar injury and weed control evaluations were made on June 6, 2007.

Results and discussion

Weed control and injury evaluations: No hybrid poplar OP 367 injury was noted in any of the treatments (Table 9). All treatments gave excellent control of Russian thistle. All treatments gave excellent control of kochia except Oust applied at 0.03 and 0.09 lb ai/ac in combination with Telar at 0.02 and 0.06 lb ai/ac and the weedy check (Table 9).

Control of vomatoxin in two varieties of Pioneer hybrid field corn

Introduction

Vomatoxin is a chemical compound of Fusarium molds. These molds are found in grains such as wheat and corn. Spring and fall weather conditions, across many areas of excess moisture, can result in vomatoxin production by Fusarium molds in corn. Vomatoxin levels above 2.0 ppm can affect the immune system of pets and cause illness or death.

Materials and methods

A field experiment was conducted in 2007 at Farmington, NM, to evaluate selected fungicides for control of vomatoxin in Pioneer seed corn (var. 37F75 and 36V75). Soils were fertilized according to New Mexico State University recommendations based on soil tests. Individual plots were four 34-in. rows 30 ft long. Treatments were applied with a compressed air backpack sprayer calibrated to deliver 30 gal/ac at 30 psi. Pioneer field corn varieties were planted on May 14 with flexi-planters equipped with disk openers. Headline, Quadris, Quilt plus Quadris, and Quilt were applied on July 31 at 6.0 oz/ac, 6 oz/ac, 10 plus 3 oz/ac, and 14 oz/ac, respectively. A split application of Quadris applied at 4.5 plus 4.5 oz/ac was applied on July 31 and August 14. All treatments were applied with a COC at 1.0% v/v. Treatments were directed to approximately 2 feet above and below the ear zone. 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. A random sample was taken from each plot and sent to the NAPI soils laboratory for vomatoxin determination, and results were completed on December 19.

Results and discussion

Vomatoxin determination and crop yields: Yields and vomatoxin results are given in Table 10. The overall average yields for 37F75 and 36V75 were 230 and 240 bu/ac, respectively. In both varieties, the non-treated checks were the highest yielding treatments. There were no significant differences among treatments for vomatoxin control (Table 10).

Table 1. Control of Annual Broadleaf Weeds with Preemergence and Preemergence Followed by Sequential Postemergence Herbicides (Laudis) in Field Corn on June 11; NMSU Agricultural Science Center at Farmington, NM, 2007

		Crop	Stand	Weed Control[d,e]				
	Rate	Injury[d]	Count	Amare	Amabl	Solni	Cheal	Saskr
Treatments[a,b]	(lb/ac)	(%)	(no.)	(%)				
Balance Pro/Laudis + AAtrex + COC + Uran 32[c]	0.03/0.08 + 0.5	95	6	100	100	100	100	99
Sequence/Laudis + AAtrex + COC + Uran 32[c]	1.75/0.08 + 0.5	33	15	100	100	92	100	88
Bicep Lite II Mag	2	5	21	100	96	99	100	99
Guardsman Max Lite	2	0	21	100	97	99	100	99
Bicep Lite II Mag/Laudis + MSO + Uran 32[c]	2/0.05	0	22	100	99	100	100	100
Guardsman Max Lite/Laudis + MSO + Uran 32[c]	2/0.05	0	21	100	99	99	100	100
Weedy check		0	21	0	0	0	0	0
LSD 0.05		21	ns	1	2	2	1	11

[a]MSO = methylated seed oil, COC = crop oil concentrate, AMS = ammonium sulfate, and Uran 32 = urea ammonium nitrate; MSO, COC, and Uran 32 applied at 1% v/v and AMS applied at 1.5% v/v.
[b]First treatment applied preemergence followed by a sequential postemergence treatment.
[c]Late postemergence treatments applied on June 26.
[d]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.
[e]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 2. Control of Annual Broadleaf Weeds with Preemergence and Preemergence Followed by Sequential Postemergence Herbicides (Laudis) in Field Corn on July 16; NMSU Agricultural Science Center at Farmington, NM, 2007

		Weed Control[d,e]					
	Rate	Amare	Amabl	Solni	Cheal	Saskr	Yield
Treatments[a,b]	(lb/ac)	(%)					(bu/ac)
Laudis + MSO + Uran 32	0.08	87	96	95	97	99	218
Laudis + AAtrex + MSO + Uran 32	0.08 + 0.5	100	10	100	100	100	250
Laudis + AAtrex + COC + Uran 32	0.08 + 0.5	100	100	100	100	100	248
Roundup OM + Laudis + AMS	1 + 0.08	87	100	96	98	96	248
Roundup OM + Laudis + AAtrex + AMS	1 + 0.08 + 0.05	99	96	100	100	100	244
Balance Pro/Laudis + AAtrex + COC + Uran 32[c]	0.03/0.08 + 0.05	100	100	100	100	100	3
Sequence/Laudis + AAtrex + COC + Uran 32[c]	1.75/0.08 + 0.05	100	100	100	100	100	191
Bicep Lite II Mag	2	98	99	96	100	96	251
Guardsman Max Lite	2	98	98	96	100	97	243
Bicep Lite II Mag/Laudis + MSO + Uran 32[c]	2/0.05	100	100	100	100	100	248
Guardsman Max Lite/Laudis + MSO + Uran 32[c]	2/0.05	100	100	100	100	100	247
Weedy check		0	0	0	0	0	95
LSD 0.05		2	1	2	1	1	18

[a]MSO = methylated seed oil, COC = crop oil concentrate, AMS = ammonium sulfate, and Uran 32 = urea ammonium nitrate; MSO, COC, and Uran 32 applied at 1% v/v and AMS applied at 1.5% v/v.
[b]First treatment applied preemergence followed by a sequential postemergence treatment.
[c]Late postemergence treatments applied on June 26.
[d]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.
[e]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 3. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence Herbicides in Field Corn on June 11; NMSU Agricultural Science Center at Farmington, NM, 2007

		Stand	Crop	Weed Control[e,f]				
	Rate	Count	Injury[e]	Amare	Amabl	Solni	Saskr	Cheal
Treatments[a,b]	(lb/ac)	(no.)	(%)	(%)				
Bicep Lite II Mag (pm)/Sequence	0.75/1.65	21	0	100	100	100	100	100
Bicep Lite II Mag (pm)/Sequence	1.5/1.65	20	0	100	100	100	100	100
Dual II Mag/Touchdown HiTech[c]	1.3/0.75	20	2	100	100	86	56	100
Guardsman Max Lite (pm)/Distinct	1.25/0.25	21	2	100	100	98	96	100
Guardsman Max Lite (pm)/Status	1.25/0.25	21	5	100	100	100	100	100
Bicep Lite II Mag (pm)/Laudis[d]	1.25/0.08	21	3	100	100	100	100	100
Guardsman Max Lite (pm)/Laudis[d]	1.25/0.08	21	2	100	100	100	100	100
Weedy check		21	0	0	0	0	0	0
LSD 0.05		ns	2	1	1	2	4	1

[a]pm = packaged mix.
[b]First treatment applied preemergence followed by a slash then a postemergence treatment.
[c]A nonionic surfactant added to treatments at 0.25% v/v.
[d]A crop oil concentrate and urea ammonium nitrate added to treatments at 1.0% v/v.
[e]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.
[f]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Saskr = Russian thistle, and Cheal = common lambsquarters.

Table 4. Control of Annual Broadleaf Weeds with Preemergence Followed by Sequential Postemergence and Postemergence Herbicides in Field Corn on July 16; NMSU Agricultural Science Center at Farmington, NM, 2007

		Weed Control[e,f]					
	Rate	Amare	Amabl	Solni	Saskr	Cheal	Yield
Treatments[a,b]	(lb/ac)	(%)					(bu/ac)
Bicep Lite II Mag(pm)/Sequence	0.75/1.65	100	100	100	100	100	240
Bicep Lite II Mag (pm)/Sequence	1.5/1.65	100	100	100	100	100	254
Dual II Mag/Touchdown HiTech[c]	1.3/0.75	100	100	100	100	100	239
Guardsman Max Lite (pm)/Distinct	1.25/0.25	100	100	100	100	100	240
Guardsman Max Lite (pm)/Status	1.25/0.25	100	100	100	100	100	233
Bicep Lite II Mag (pm)/Laudis[d]	1.25/0.08	100	100	100	100	100	252
Guardsman Max Lite (pm)/Laudis[d]	1.25/0.08	100	100	100	100	100	244
Sequence[g]	1.65	90	90	93	79	90	247
Touchdown HiTech[c,g]	0.75	82	84	92	73	93	208
Weedy check		0	0	0	0	0	110
LSD 0.05		3	2	2	4	2	20

[a]pm = packaged mix.
[b]First treatment applied preemergence followed by a slash then a postemergence treatment.
[c]A nonionic surfactant added to treatments at 0.25% v/v.
[d]A crop oil concentrate and urea ammonium nitrate added to treatments at 1.0% v/v.
[e]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.
[f]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Saskr = Russian thistle, and Cheal = common lambsquarters.
[g]Treatments applied postemergence.

Table 5. Control of Annual Broadleaf Weeds in Dry Beans with Preemergence and Preemergence Followed by Sequential Postemergence Treatments on June 27; NMSU Agricultural Science Center at Farmington, NM, 2007

Treatments	Rate (lb/ac)	Weed Control[b,c] Cheal (%)	Amare	Amabl	Solni	Saskr
Valor	0.05	100	99	99	100	99
Outlook	0.56	100	99	99	98	37
Valor + Prowl	0.05 + 0.8	100	99	100	99	99
Valor + Prowl H_2O	0.05 + 0.8	100	99	100	100	99
Outlook + Prowl	0.56 + 0.8	100	100	100	99	56
Outlook + Prowl H_2O	0.56 + 0.8	100	100	100	99	63
Valor/Raptor + Basagran[a]	0.05/0.032 + 0.25	100	99	100	100	98
Outlook/Raptor + Basagran[a]	0.56/0.032 + 0.25	100	99	100	97	58
Outlook + Prowl/Raptor + Basagran[a]	0.56 + 0.8/0.032 + 0.25	100	100	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	99	99
Weedy check		0	0	0	0	0
LSD 0.05		1	1	1	2	5

[a]First treatment applied preemergence and evaluated on June 27, followed by a sequential postemergence treatment. Postemergence treatments were applied with a COC and 32-0-0 at 0.5% and 2% v/v, respectively.
[b]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.
[c]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Saskr = Russian thistle.

Table 6. Control of Annual Broadleaf Weeds in Dry Beans with Preemergence and Preemergence Followed by Sequential Postemergence Treatments on July 30; NMSU Agricultural Science Center at Farmington, NM, 2007

Treatments	Rate (lb/ac)	Weed Control[b,c] Cheal (%)	Amare	Amabl	Solni	Saskr	Bill Z Yield (lb/ac)
Valor	0.05	99	96	97	97	97	4,111
Outlook	0.56	98	90	90	86	30	3,074
Valor + Prowl	0.05 + 0.8	99	98	96	97	98	4,342
Valor + Prowl H_2O	0.05 + 0.8	99	96	96	96	98	4,342
Outlook + Prowl	0.56 + 0.8	99	90	92	91	36	3,381
Outlook + Prowl H_2O	0.56 + 0.8	100	95	94	92	46	3,381
Valor/Raptor + Basagran[a]	0.05/0.032 + 0.25	100	98	98	98	97	4,111
Outlook/Raptor + Basagran[a]	0.56/0.032 + 0.25	100	98	98	97	93	4,111
Outlook + Prowl/Raptor + Basagran[a]	0.56 + 0.8/0.032 + 0.25	100	99	98	97	94	3,919
Outlook + Prowl H_2O/Raptor + Basagran[a]	0.56 + 0.8/0.032 + 0.25	100	98	96	98	93	3,957
Valor + Prowl H_2O/Raptor + Basagran[a]	0.05 + 0.8/0.032 + 0.25	100	98	97	98	98	4,111
Weedy check		0	0	0	0	0	499
LSD 0.05		1	2	3	3	7	568

[a]First treatment applied preemergence and rated on July 30, followed by a sequential postemergence treatment and rated on August 1. Postemergence treatments were applied with a COC and 32-0-0 at 0.5% and 2% v/v, respectively.
[b]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.
[c]Cheal = common lambsquarters, Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, and Saskr = Russian thistle.

Table 7. Control of Annual Broadleaf Weeds in Pioneer 63N81 Express-Tolerant Sunflowers with Preemergence Herbicides, June 27; NMSU Agricultural Science Center at Farmington, NM, 2007

Treatments[a]	Rate (lb/ac)	Crop Injury[b] (%)	Weed Control[b,c] (%) Amare	Amabl	Solni	Cheal	Saskr
Prowl/Express + COC	0.8/0.008	0	62	57	94	100	67
Prowl/Express + COC	0.8/0.015	0	60	61	96	100	68
Spartan/Express + COC	0.14/0.008	4	100	100	100	100	100
Spartan/Express + COC	0.14/0.015	5	100	100	100	100	100
Dual Mag/Express + COC	1/0.008	0	96	98	95	94	55
Dual Mag/Express + COC	1/0.015	0	99	99	98	98	56
Outlook/Express + COC	0.56/0.008	7	98	100	99	99	57
Outlook/Express + COC	0.56/0.015	5	99	100	99	98	58
Weedy check		0	0	0	0	0	0
LSD 0.05		2	5	4	3	4	3

[a]First treatment applied preemergence followed by a sequential treatment of Express with crop oil concentrate (COC) at 1.0% v/v.
[b]Based on a visual scale from 0-100, where 0 = no control or crop injury and 100 = dead plants.
[c]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 8. Yield and Control of Annual Broadleaf Weeds in Express-Tolerant Sunflowers with Preemergence Followed by Sequential Applications of Express, July 26; NMSU Agricultural Science Center at Farmington, NM, 2007

Treatments[a,b]	Rate (lb/ac)	Weed Control[c,d] (%) Amare	Amabl	Solni	Cheal	Saskr	Yield (lb/ac)
Prowl/Express + COC	0.8/0.008	92	91	96	100	95	3,500
Prowl/Express + COC	0.8/0.015	93	94	98	100	97	3,533
Spartan/Express + COC	0.14/0.008	100	100	100	100	100	3,475
Spartan/Express + COC	0.14/0.015	100	100	100	100	100	3,552
Dual Mag/Express + COC	1/0.008	99	100	97	99	96	3,513
Dual Mag/Express + COC	1/0.015	97	99	98	100	98	3,500
Outlook/Express + COC	0.56/0.008	100	100	99	100	95	3,500
Outlook/Express + COC	0.56/0.015	100	100	100	100	97	3,526
Express + COC[b]	0.008	55	67	83	92	81	3,072
Express + COC[b]	0.015	72	75	90	99	88	3,225
Express + COC[b]	0.024	76	77	93	100	96	3,244
Weedy check		0	0	0	0	0	1,356
LSD 0.05		3	2	3	1	3	292

[a]First treatment applied preemergence followed by a sequential treatment of Express with crop oil concentrate (COC) at 1.0% v/v.
[b]Treatments applied postemergence with crop oil concentrate (COC) at 1.0% v/v.
[c]Based on a visual scale from 0-100, where 0 = no control and 100 = dead plants.
[d]Amare = redroot pigweed, Amabl = prostrate pigweed, Solni = black nightshade, Cheal = common lambsquarters, and Saskr = Russian thistle.

Table 9. Control of Russian Thistle and Kochia with Fall Applied Herbicides at the NAPI Tree Farm, on OP 367 Hybrid Poplar, and Evaluated on June 6; San Juan County, NM, 2007

			Weed Control[b]	
	Rate	OP 367 Injury[b]	Saskr	Kchsc
Treatments[a]	(lb ai/ac)	(%)		
Oust + Escort	0.035 + 0.009	0	100	95
Oust + Escort	0.07 + 0.18	0	99	96
Oust + Escort	0.105 + 0.027	0	100	94
Oust + Telar	0.03 + 0.02	0	100	81
Oust + Telar	0.06 + 0.04	0	100	99
Oust + Telar	0.09 + 0.06	0	99	86
Oust + Telar + Karmex	0.06 + 0.04 + 1.6	0	100	100
Oust + Telar + Karmex	0.09 + 0.06 + 1.6	0	99	100
Sinbar + Karmex	1.6 + 1.6	0	100	100
Princep	1.6	0	100	98
Weedy check		0	0	0
LSD 0.05			1	3

[a]Treatments applied on November 20, 2006, and rated on June 6, 2007.
[b]Based on a visual scale from 0 to 100, where 0 = no control or tree injury and 100 = dead plants; Saskr = Russian thistle and Kchsc = kochia.

Table 10. Yield and Control of Vomatoxin in Two Pioneer Corn Varieties, November 19; NMSU Agricultural Science Center at Farmington, NM, 2007

		Pioneer 37F75	Pioneer 36V75	Pioneer 37F75	Pioneer 36V75
	Rate	Yield	Yield		
Treatments[a]	(oz/ac)	(bu/ac)	(bu/ac)	(ppm Vomatoxin[c])	
Headline	6	227	239	0.09	0.02
Quadris	6	227	242	0.09	0.02
Quadris + Quilt	3 + 10	234	241	0.04	0.02
Quilt	14	229	237	0.02	0.06
Quadris + Quadris[b]	4.5 + 4.5	235	243	0.05	0.02
Check		238	256	0.08	0.03
LSD 0.05		ns	18	ns	ns

[a]Treatments applied with a COC at 1.0% v/v.
[b]Treatment applied as a split application on July 31 and August 14, 2007.
[c]Vomatoxin results were done by the Navajo Products Industry Soil Laboratory on December 19, 2007.

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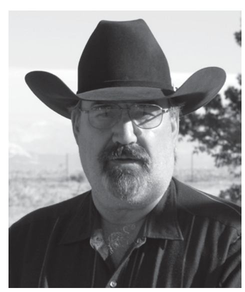

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