Weed Control Research
1990 - 1993

Department of Crop and Soil Science, Oregon State University

Oregon Department of Agriculture

County Extension Agents

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Contents

Directed Herbicides in Corn

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Introduction

Registered herbicides, sprayed at the improper time, can injure the crop. This may result in reduced yields or total loss of the crop. If herbicide contact with the plant leaves can be minimized, damage may be reduced to a tolerable level or eliminated. Directed spray systems reduce plant contact by spraying underneath the crop canopy. This reduces crop damage and may increase weed control since the spray is directed at the weeds and not intercepted by the crop canopy. Directed sprayers are best suited for row crops such as corn.

Drop-nozzle spray systems have been used for directed spraying for many years. Drop-pipes are attached to a boom and hang below the crop canopy. The drop-pipes are not rigid, allowing for movement if the pipe hits the ground. Proper spray height is hard to maintain with this system, which may reduce weed control and crop safety. Shields may improve crop protection, but even with the shield, splashing occurs as the tractor encounters rough terrain. Splashing chemicals may land on the leaves, causing crop damage.

Movement of the spray nozzles can be reduced by mounting them on a skid. The skid system holds the nozzle at a fixed level in the field. This results in less chemical contacting the crop and maintains a constant spray width for better weed control. For corn, best results are achieved with the herbicide spraying the lower 25% of the stalk. Shields can also be added to this sprayer to protect lower leaves and minimize spray contact.

In this experiment, equipment called the Precision Postemergence-Directed Sprayer was used. The equipment was manufactured by John Deere but can probably be made in most farm shops. Trials in Wisconsin, where they have hard-to-control annual grass weeds, such as wild proso millet, showed that several chemicals sprayed in this manner, do not reduce corn yields.

The objectives of this trial were 1) to see if this design allowed for acceptable weed control, 2) to observe any damage that may arise from a variety of chemicals used, and 3) make growers aware of another weed control option.

Procedure

Field corn was planted on May 20, 1992 in 30" rows by a 'Planet Jr' planter. No pre-emergence herbicides were used for early weed control. The corn was cultivated and hilled when it was about 8 to 10 inches tall. Many larger weeds that were in the corn rows were not controlled by this process. Italian ryegrass and rape seed were then sown over the entire trial to produce a uniform weed cover.

Spraying took place when the corn was 18" tall. The Italian ryegrass was 3 to 5" and the rape was at the 1- to 2-leaf stage. Four 15002 double outlet nozzles and 15" spacing create a broadcast spray pattern with minimum height. Spray is directed precisely at the lower 25% of the plant and in this case was sprayed on the lower 4 to 5" of the corn plant. Plant spray contact is minimized and drift potential may be reduced.

Several herbicides were used in this experiment to look at the effectiveness and crop damage that each may exhibit. By using specific chemicals separately, the results may provide an answer to a specific weed problem whether it be broadleaf or a grass weed. A cost comparison and rates in lbs ai/A are in Table 1.

Table 1. Chemical rates.

Chemicals Common name	Trade name	Lbs ai/A
Paraquat + Atrazine + Moract	Gramoxone Extra + Aatrex	0.47 + 0.5 + 1 qt/A
Paraquat + X77	Gramoxone Extra	0.47 + .25% v/v
Bromoxynil	Buctril	0.375
Bromoxynil + Atrazine	Buctril + Aatrex	0.25 + 0.5
Bromoxynil + Metribuzin	Buctril + Lexone	0.25 + 3 oz ai
Atrazine + Bentazon + Dash	Aatrex + Basagran	0.5 + 0.5 + 1 qt/A
Sethoxydim + Moract	Poast	0.2 + 1 qt/A
Metribuzin	Lexone	3 oz ai/A
Metribuzin + 2,4-D	Lexone + 2,4-D amine	3 oz + 0.25
Ametryn + Moract	Evik	2.5 + 1 qt/A
Primsulfuron + X77	Beacon	0.5 oz ai/A + .25% v/v
Nicosulfuron + X77	Accent	0.5 oz ai/A + .25% v/v
2,4-D amine		0.25
Dicamba	Banvel	0.16
Check		

Results

Evaluations were made 5 and 12 days after spraying. The first evaluation was to look for corn damage and no rating of control was made. At that time there was damage to the bottom leaf in the paraquat treatment only. Since the bottom leaves probably do not add much to the growth of the plant, this is not considered important. Paraquat had also killed almost all of the annual ryegrass and rape in the treated plots. Other herbicides had also begun to show affects on the weeds at this time. There was no apparent damage from the other herbicides.

The second evaluation was used to rate the control of the sown weeds and to evaluate corn damage. Corn damage was visually assessed by stalk damage and or by a difference in height of the corn by treatments. As in the first evaluation, paraquat was the only herbicide to show crop damage. The damage was still to the first leaf of the plants. There was no difference in height that could be related to the spraying.

Paraquat gave nearly total control of the sown weeds. Primsulfuron and nicosulfuron both gave good results on sown weeds. This control may have improved with time. Other chemicals that target specific weeds such as sethoxydim and 2,4-D also gave excellent control. The weed control results are shown in the following table.

Conclusion

The first objective was to look at weed control. Even though the application was delayed one week by wet weather, many of the chemicals controlled the sown weeds at a high level. Paraquat gave the best control of both weeds of any herbicides used and has no soil residual activity. Some of the other chemicals do have residual activity so rotation crops should be selected with this in mind. Percent weed control by repetition and a total control is shown in Table 2.

Sethoxydim provided total control of the grasses. Metribuzin was the only herbicide with grass activity that did not reduce the grass cover significantly. Broadleaf weeds were controlled except by Banvel, which is weak on the mustard family. None of the treatments controlled the weeds that escaped the cultivation. These weeds were 8 to 16" tall.

Table 2. Percent weed control in directed spray trial.

	Rep 1 % Control		Rep 2 % Control		Total % Control	
Chemicals	Grass	Rape	Grass	Rape	Grass	Rape
Gramoxone Extra + Aatrex	100	100	100	100	100	100
Gramoxone Extra + X77	100	100	90	90	95	95
Buctril	0	100	0	100	0	95
Buctril + Aatrex	40	100	40	100	40	100
Buctril + Lexone	60	100	50	100	55	100
Aatrex + Basagran + Dash	50-	100	40	100	45	100
Poast + Moract	100	0	100	0	100	0
Lexone	0	100	0	100	0	100
Lexone + 2,4-D	10	100	0	100	5	100
Evik + Moract	40	100	35	100	38	100
Beacon + X77	50	70	70	60	60	65
Accent + X77	80	60	90	95	85	78
2,4-D amine	0	90	0	80	0	85
Banvel	0	30	0	20	0	25
check	0	0	0	0	0	0

The second objective was to evaluate for crop damage. Literature shows that sethoxydim, Gramoxone Extra and Evik, applied as directed sprays, do not reduce corn yields. We did not take yield samples, so yield reduction could not be measured. From visual evaluations there was no damage to the corn from any of the herbicides.

To further look at control we combined the cost of the chemicals per acre and the total weed control that each showed into Table 3.

Table 3. Costs and total weed control

Chemicals	Cost/A	% Control Grass	% Control Rape
Gramoxone Extra + Aatrex + Moract	9.45	100	100
Gramoxone Extra + X77	7.75	95	95
Buctril	10.00	0	100
Buctril + Aatrex	8.40	40	100
Buctril + Lexone	13.30	55	100
Aatrex + Basagran + Dash	10.55	45	100
Poast + Moract	17.35	100	0
Lexone	6.60	0	100
Lexone + 2,4-D	7.60	5	100
Evik + Moract	21.00	38	100
Beacon + X77	13.00	60	65
Accent + X77	16.50	85	78
2,4-D amine	1.00	0	85
Banvel	2.85	0	25
Check			

The third objective was to demonstrate the effectiveness of directed sprays. With only one year of observation, this trial showed that the skid-mounted directed sprayer is a tool that should be looked at in a spray program. It allows for precision spraying of chemicals underneath the crop canopy. But this sprayer is not a tool to use by itself. It is recommended to be used to control weeds that may escape from a pre-emergent herbicide and cultivation. Corn should be sprayed when it is above 16" and the height is limited only by the sprayer clearance. Herbicides can be chosen by weed height. Weeds lower than the nozzle can be controlled with paraquat, a contact chemical. Taller weeds may need a herbicide such as Poast or 2,4-D for their systemic action.

Further Research

Questions still remain on the directed sprayer. Now that we have seen it work, it would be helpful to continue examining the benefits of the sprayer. In corn, questions such as timing, rates, variety differences in sweet corn need to be looked at. Also the research should include yield data to establish better results. Studies should include the use of pre-emergence herbicides and cultivation to better fit the sprayer into a growers program.

St. Johnswort Control with Herbicides

L.C. Burrill and Jay Carr

St. Johnswort is a creeping perennial that is wide-spread in Oregon and has the potential to infest most areas that do not receive annual tillage. St. Johnswort has been controlled in the west by the Chrysolina beetles since they were introduced in the 1950s. Control has been cyclic as expected from biological control with insects, but in recent years there have been several requests for information on chemical control.

Because little research has been done on herbicidal control of St. Johnswort, we established a field test to screen some commercial herbicides.

The site selected is on abandoned farmland several miles north of Baker City in Baker County, Oregon. A fairly thick and uniform population of St. Johnswort allowed a reliable assessment of herbicide effect. The plants were under moisture stress at the time of application.

On June 8, 1992, treatments were applied to 8 by 25 foot plots replicated three times. A hand-held sprayer fitted with four 8004 nozzles was used. Herbicides were mixed with water and applied in a total volume of 30 gallons per acre at 30 psi.

The first evaluation was made only 7 weeks following treatment. The ester of 2,4-D, triclopyr plus 2,4-D, triclopyr ester, picloram, imazapyr, and metsulfuron had significant activity against St. Johnswort. We were surprised that one year later only the picloram had given adequate control. Repeat applications of the more active herbicide might be effective, but that was not part of this experiment. We are puzzled at the activity of glyphosate in two of the six plots treated. It is not unusual for glyphosate activity on perennial plants to improve in the second year, but the lack of control in the plots treated with glyphosate and Silwet (a silicone-based surfactant) makes the observed activity suspect.

St. Johnswort Control, Baker Co., 1992

Treatment	Rate lbs ae/A	% Control July 24, 1992 R1	R2	R3	Avg.	% Control July 21, 1993 R1	R2	R3	Avg.
2,4-D amine	1.0	0	0	0	0	0	20	0	7
2,4-D ester	1.0	60	50	50	53	0	0	0	0
2,4-D + triclopyr (Crossbow)	1.0 + .5	85	90	90	88	20	20	0	13
triclopyr amine (Garlon 3)	1.0	0	0	0	0	0	0	0	0
triclopyr ester (Garlon 4)	1.0	90	85	85	87	0	0	40	13
dicamba (Banvel)	.5	0	0	0	0	0	0	0	0
picloram (Tordon)	.5	98	98	85	94	100	100	98	99
clopyralid (Stinger)	.5	0	0	0	0	0	0	0	0
glyphosate (Roundup)	1.0	0	0	0	0	0	50	85	45
glyphosate (Roundup) + Silwet	1.0 + .25%	0	0	0	0	0	0	0	0
imazapyr (Arsenal)	.5	50	50	50	50	50	60	50	53
dicamba + 2,4-D (Weedmaster)	.25 + .7	0	0	0	0	0	0	0	0
metsulfuron + X-77 (Escort/Ally)	1 oz product	85	90	90	88	0	0	0	0
check		0	0	0	0	0	0	0	0

Canada Thistle Control with Herbicides
Wilson Sheep Farm, Benton County

Jim Fitzsimmons

On July 2, 1992, a field test was established to evaluate the effect of eight herbicides on Canada thistle. The Canada thistle was in the bud stage and was 4 to 12 inches tall. The crop was pasture grasses and was also 2 to 12 inches tall. Applications were made with a hand held boom and a CO_2 backpack sprayer. Six 8006 flat fan nozzles were used to apply herbicides in water at a volume of 26 gallons per acre. Visual evaluations were made on July 22, September 4, and November 5, 1992 and are reported in the table. Plots were resprayed on November 5, 1993 with the same herbicides except Roundup. When stakes were pulled on May 3, 1993, all plots had some Canada thistle regrowth.

Chemicals	Plots	Lbs ae/A	Conc.	Prod/1000 sq ft
STINGER clopyralid	101 204 307	0.21 lb	3 lb/gal	8.7 ml
CURTAIL clopyralid + MCPA	102 208 304	1.2 qt/A	0.38 lb	26.1 ml 2.35 lb/gal
BANVEL dicamba + 2,4-D	103 207 309	0.15 lb ai 1.2 lb ai	1.0 lb/gal 3.8 lb/gal	13 ml 27.5 ml
MCPA	104 209 308	1.2 lb ae	3.86 lb/gal	27 ml
TORDON picloram	105 201 306	0.6 lb ae	2 lb/gal	26 ml
CROSSBOW triclopyr + 2,4-D	106 203 305	3.6 qt/A 3 lb/gal	1.5 lb	78.2 ml
ROUNDUP Glyphosate	108 205 302	1.8 lb ae	4 lb/gal	39.1 ml
Check	109 206 301			

[Insert map here]

Thistle Evaluation
Wilson Sheep Farm
1992

	7/22/92				9/4/92				11/5/92			
	Percent control				Percent control				Percent regrowth			
	R1	R2	R3	Avg	R1	R2	R3	Avg	R1	R2	R3	Avg
STINGER clopyralid	75	85	90	83	100	100	95	98	20	30	30	27
CURTAIL clopyralid	75	95	80	83	100	100	90	97	30	50	50	43
BANVEL dicamba + 2,4-D	90	90	90	90	85	95	100	93	60	40	70	57
MCPA	70	50	70	63	55	40	40	45	50	60	60	57
TORDON picloram	100	100	100	100	100	100	100	100	2	2	1	2
CROSSBOW triclopyr + 2,4-D	90	90	90	90	80	85	85	83	100	90	100	97
ROUNDUP	40	50	50	7	90	95	99	95	40	80	80	67
CHECK	0	0	0	0	10	5	10	8	100	100	90	97

Canada Thistle Control with Herbicides
Wilson Sheep Farm OSU
Benton County
1992

<u>First Application</u>	July 2, 1992
Sprayer:	CO_2, hand held 6 foot boom 8006 flat fan nozzles
Carrier:	Water 2300 ml for 1000 sq ft or 26 gal/A
Temperature:	74 F
Soil:	dry on surface
Foliage:	dry
Crop:	pasture grasses
Plot size:	12' x 20'
Exp. size:	108' x 75'
Thistle size:	4 to 18 inches tops grazed by sheep just prior to spraying
<u>Second Application</u>	November 5, 1992
Sprayer:	$CO_{2,}$, hand held 6 foot boom 8006 flat fan nozzles
Carrier:	Water 2300 ml for 1000 sq ft or 26 gal/A
Temperature:	58° F
Soil:	moist
Foliage:	wet from dew
Crop:	pasture grasses
Plot size:	12' x 20'
Exp. size:	108' x 75'
Thistle size:	3 to 8 inch rosettes

Control of Broadleaf Dock (*Rumex obtusifolius*) in Western Oregon Pastures

Stanley Fultz, John Williams, and Larry Burrill

Broadleaf dock is a common weed in coastal pastures of western Oregon. This taprooted perennial often becomes dense enough to seriously reduce forage production. Broadleaf dock is casually or deliberately eaten by livestock, but all species of Rumex have been suspected of producing occasional livestock losses in several countries. Species of Rumex owe their toxicity to soluble oxalates, but it appears that Rumex with a dangerous level of oxalate content is rare.

It is unclear to what extent the seed of broadleaf dock can pass unharmed through the digestive system of animals to reinfest pastures. The seed remains viable in the soil for several years and is also well adapted to float in water. Pastures subject to flooding can be assured of a regular supply of seeds.

Mowing will not control broadleaf dock and even the most vigorous of pasture species does not resist invasion. Selective herbicides would have an advantage over periodic plowing and reestablishment of pastures because tillage brings new seed to the surface to germinate and also removes the land from production for a time.

Coos County

Two herbicide trials were conducted to develop information on control of broadleaf dock and safety to pasture species.

On October 9, 1990, six herbicides were applied to plots on a dairy pasture in Coos County. The pasture has a long history of broadleaf dock in spite of periodic rotations to a corn crop. A CO_2 backpack sprayer with a four-nozzle boom was used to apply the herbicides to plots that were 12 by 30 feet and replicated three times. This is an irrigated pasture so the dock was not under stress. The pasture had been mowed after a recent grazing and the dock was regrowing nicely when herbicides were applied.

Evaluations were made 40 days after application and again 6 months after treatment. Treatments and results can be seen in Table I.

Tillamook County

The second trial was sprayed in a dairy pasture in Tillamook County on July 9, 1991. Four herbicides were applied with a CO_2 sprayer and a four-nozzle boom to plots that were 12 by 30 feet and replicated 3 times. The dock was not growing under stress and was regrowing from a recent mowing.

Evaluations were made 3 months and 17 months after treatment. Even after 17 months, the low rate of Ally (.20 oz of product) was controlling most of the dock. MCPA controlled the dock so well in the first month after treatment that the grower treated the remainder of the pasture with equally good results. The complete lack of dock control in the second evaluation is somewhat surprising and it is not clear if the treated plants recovered or if new plants came from seed.

At the time of the second evaluation there was a good population of creeping buttercup so performance on this common pasture weed was evaluated as well. Results can be seen in Table II.

From the results we can draw several conclusions:

1. Ally (Escort-metsulfuron) will control broadleaf dock and creeping buttercup for more than one year.

2. MCPA and Banvel may give excellent initial control of broadleaf dock, but control does not carry into the following year.

3. Ally and Banvel will kill clover but MCPA is fairly safe on clovers.

4. Stinger, which is known to control other members of the buckwheat family, does not control broadleaf dock. It does kill clovers.

Broadleaf Dock Control

Bill Mast Farm - Coos County
1990-1991

Treatment	Rate	November 19,1990 Percent broadleaf dock control R1	R2	R3	Avg.	Percent injury to clover R1	R2	R3	Avg.	April 19, 1991 Percent broadleaf dock control R1	R2	R3	Avg.	Percent injury to clover R1	R2	R3	Avg.
Metsulfuron-Ally + surfactant	.45 oz ai	100	100	95	98	100	90	90	93	100	100	98	99	100	100	100	100
Thifensulfuron + Tribenuron Harmony Extra	.375 oz ai	100	90	90	93	100	90	80	90	90	80	90	87	100	98	95	98
MCPA amine	.5 lb ae	80	30	0	37	0	0	0	0	40	0	0	13	0	0	0	0
MCPA amine	1.0 lb ae	30	30	30	30	0	0	0	0	75	20	0	32	0	0	0	0
Clopyralid-Stinger	.375 lb ae	40	20	20	27	100	100	90	97	0	0	20	7	100	100	100	100
Dicamba-Banvel	.25 lb ae	40	90	--	43	90	100	--	95	20	80	--	33	90	95	--	62
Dicamba-Banvel	.5 lb ae	75	50	80	68	100	90	100	97	20	20	50	30	100	90	100	97
2,4-D B	.5 lb ae	50	40	50	47	0	30	30	20	20	0	20	13	0	0	0	0
2,4-D B	1.0 lb ae	80	40	40	53	0	0	20	7	20	30	0	17	0	0	0	0
Check		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Herbicides applied October 9, 1990

Broadleaf Dock Control

Walt and Ron Beeler Farm - Tillamook County
1991-1992

Treatment	Rate	% Broadleaf Dock Control October 9, 1991 R1	R2	R3	Avg.	% Broadleaf Dock Control November 23, 1992 R1	R2	R3	Avg.	% Control Creeping Buttercup November 23, 1992 R1	R2	R3	Avg.
Metsulfuron-Ally + surfactant	.5 oz ai	100	100	100	100	100	100	98	99	100	100	100	100
Metsulfuron-Ally + surfactant	.25 oz ai	100	100	100	100	100	98	100	99	100	100	100	100
Metsulfuron-Ally + surfactant	.12 oz ai	99	100	98	99	100	100	95	98	100	100	90	97
MCPA Amine	1.0 lb ae	95	90	60	82	0	0	0	0	100	90	100	97
MCPA Amine	1.5 lb ae	99	90	70	86	0	0	0	0	100	95	100	98
Dicamba-Banvel	.25 lb ae	99	50	30	60	0	0	0	0	95	90	60	82
Dicamba-Banvel	.5 lb ae	50	70	50	57	40	0	0	13	100	100	0	67
2,4-D B	1.0 lb ae	90	90	30	70	30	0	0	10	100	50	60	70
Check		0	0	0	0	0	0	0	0	0	0	0	0

Wild Carrot Control with Herbicides

Richard Baker Farm, Linn County

Larry C. Burrill

On March 23, 1992, a field test was established to evaluate the effect of 12 herbicides on wild carrot. The carrots were in the rosette stage and 5 to 8 inches across. The crop was volunteer Italian ryegrass. Applications were made with a hand held boom and a CO_2 backpack sprayer. Six 8004 flat fan nozzles were used to apply herbicides in water at a total volume of 29 gallons per acre. Visual evaluations were made on April 20, 1992 and are reported in the table. When the stakes were pulled on the experiment about three weeks later, no carrots could be found in plots treated with Express or Escort. In all of the other plots, the carrot plants did not have obvious symptoms of the treatments.

Applied March 23, 1992		Evaluated April 20, 1992 Percent Control			
	Rate	R1	R2	R3	Avg.
Express tribenuron	0.33 oz/a + X-77 at .25% vv	50	70	60	60
Escort metsulfuron	0.33 oz/a + X-77 at .25% vv	75	80	80	78
Crossbow triclopyr + 2,4-D	0.25 lb + 0.5 lb ai	40	50	50	47
Garlon 3-triclopyr	0.5 lb ae	30	20	50	33
Banvel dicamba	0.12 lb ae	0	0	0	0
MCPA	0.5 lb ae	0	0	0	0
Tordon picloram	0.12 lb ae	0	0	0	0
Curtail clopyralid + 2,4-D	0.0875 lb + 0.5 lb ae	0	0	20	7
Buctril bromoxynil	0.25 lb ai	0	0	0	0
2,4-D amine	0.5 lb ae	0	0	0	0
Stinger clopyralid	0.175 lb ae	30	0	0	10
Bromoxynil + MCPA	0.25 lb + 0.25 lb ai	0	30	0	10
Check		0	0	0	0

On April 20, Express and Escort had caused about 60% stunting of the annual ryegrass.

Control of Sharppoint Fluvellin (*Kickxia elatine*)

John H. Neumeister and Jim Fitzsimmons

Sharppoint Fluvellin is a creeping annual of the figwort (Scrophulariceae) family. The figwort family includes other weed species such as common mullein, lesser snapdragon, and the speedwells. Sharppoint Fluvellin is also commonly known as hairy bindweed or cancerwort. Leaves are alternate, ½ to 1 inch long and rounded as seedlings. Leaves developing later become arrow shaped. Flowers are borne singly from the leaf axils and are about ½ inch long. Flowers are white to pale yellow with a purple upper lip. This weed is becoming a problem in several field crops and nursery stock. After germination in the spring, it quickly forms a lush prostrate growth that competes aggressively for light, nutrients, and water. Occasionally, a seed stalk is formed.

This report summarizes two recent greenhouse studies on seedling sharppoint fluvellin and a field study in orchardgrass grown for seed in the fall of 1987.

Preemergent Control of Sharppoint Fluvellin

This study was established in February, 1992 to evaluate the efficacy of seven preemergent herbicides and two preplant herbicides on the control of sharppoint fluvellin. Seed collected in the Corvallis area were tested for germination. The germination rate was low, so 10 to 20 seeds were planted in 2 inch plastic pots at a depth of ¼ inch. On the following day, the preemergent herbicides were broadcast on the soil surface at two rates as indicated in Table 1. The preplant treatments were applied to the soil surface of unseeded pots and incorporated by stirring. Seeds were then planted at the same rate and depth. The pots were then placed at random on the greenhouse bench and watered by overhead sprinkling as necessary. Seedlings that emerged were periodically counted. Observations at 13 weeks are recorded in Table 1. Although some seedlings emerged in all pots except for those treated with bromacil, most were stunted and did not grow beyond the four leaf stage. By 13 weeks all seedlings were dead with the exception of a few plants in the untreated pots and the pots treated with Hyvar X and Treflan.

Table 1. Preemergent Control of Sharppoint Fluvellin - Oregon State University

Treatment Preemergent		Rate lb/A ai	Seedlings at 13 weeks	Treatment Preplant		Rate lb/A ai	Seedlings at 13 weeks
AAtrex	atrazine	1.0	0	Treflan	trifluralin	0.5	2
		2.0	0			1.0	3
Karmex	diuron	2.0	0	Eptam	EPTC	2.0	0
		3.0	0			3.0	0
Hyvar X	bromacil	0.25	0				
		0.5	0				
Lexone	metribuzin	0.25	0				
		0.5	0	Check		0.0	1
Kerb	pronamide	1.0	0				
		2.0	0				
Lasso	alachlor	2.0	0				
		4.0	0				
Dual	metolachlor	2.0	1				
		4.0	0				

Postemergent Control of Sharppoint Fluvellin

A second study was initiated in February, 1992 to evaluate the efficacy of 11 postemergent broadleaf herbicides for control of sharppoint fluvellin. Preplanted seedlings at the 4 to 6 leaf stage were thinned to a single vigorous seedling in each pot. The pots were then placed in an order determined at random. The herbicides were broadcast on the plants at the rates indicated in Table 2. The pots were placed on the greenhouse bench and watered by overhead sprinkling and fertilized as necessary. The plants were periodically evaluated for percent reduction in biomass relative to the controls. The observations at 9 weeks are listed below in Table 2. Complete kill is 100%. Goal produced a complete kill on all seedlings at either rate within 24 hours. Roundup, Harmony Extra, and Express demonstrated excellent control within 2 weeks. Pursuit and Banvel at the higher rate were also effective. Several other treatments resulted in uneven or partial control. Buctril and Stinger at either rate and Basagran at the low rate were apparently ineffective. Gramoxone caused an immediate die off of all foliage but regrowth began within one week and nearly all Gramoxone-treated plants recovered by the end of the experiment.

Table 2. Postemergent Control of Sharppoint Fluvellin - Oregon State University

Treatment Preemergent		Rate lb/A ai	Seedlings 9 weeks	Treatment Preplant		Rate lb/A ai	Seedlings 9 weeks
2,4-D	2,4-D	0.25	10	Goal	oxyfluorfen	0.047	100
		0.5	51			0.094	100
Basagran	bentazon X77	1.0	0	Gramoxone	paraquat X-77	0.25	1
		2.0	55			0.5	33
Buctril	bromoxynil	0.125	0	Harmony	tribenuron X-77	0.03	100
		0.25	0	Extra	& thifensulfuron	0.06	100
Stinger	clopyralid	0.125	1	Express	tribenuron X-77	0.03	100
		0.25	0			0.06	100
Banvel	dicamba	0.25	39				
		0.5	89	Check		0.0	0
Roundup	glyphosate	0.25	90				
		0.5	100		LSD (.05) =		28
Pursuit	imazethapyr x-77	0.047	50		Standard Deviation =		20
		0.094	90		CV =		38

Mature Sharppoint Fluvellin in Orchardgrass

A study was performed in the fall of 1987 by George Mueller-Warrant, USDA agronomist, to test the efficacy of 18 herbicides on control of mature sharppoint fluvellin growing in a field of spring-seeded orchardgrass. Plots were evaluated on two dates for percent control and on the second date for injury to the crop. Application rates and results are listed in Table 3. Aatrex, Ignite, Lorox, and Igran had nearly complete kill. Ally, Glean, Hyvar XL, and Lexone killed 75 to 85% of the weeds. All other materials demonstrated lower levels of control. Banvel, 2,4-D, and MCPA did not control the mature sharppoint fluvellin even though they are usually effective on other broadleaf weeds.

Table 3. Control of Mature Sharppoint Fluvellin - USDA (George Mueller-Warrant, 11/12/87)

Treatment	Rate lb/A ai	% Control		Rate lb/A ai	% Control
Aatrex	1.0	98	Lexone	0.25	80
Basagran	0.5	48	Garlon	0.5	30
w/crop oil	2.0		2,4-D	1.0	43
Ignite	0.5	100	Brominal	0.5	38
Ally	0.31	85	MCPA	1.0	38
Glean	0.31	83	Banvel	0.5	28
Amber	0.31	68	Weedmaster	0.5	50
Classic	0.31	23	Igran	0.75	100
Scepter	0.25	55	Goal	0.25	58
w/crop oil	2.0		Cobra	0.25	68
Pursuit	0.25	40	Paraquat	0.5	35
w/crop oil	2.0		w/X-77	0.5	
Lontrel	0.25	13			
Karmex	1.6	18	LSD (0.05) =		15
Lorox	1.0	99	Standard Deviation =		7
Hyvar XL	0.33	75	CV =		13

Summary

From this research, it is clear that several commonly used preemergent herbicides are preventing sharppoint fluvellin from becoming established as a problem. Once the seedling emerges, sharppoint fluvellin is fairly easy to control when it is small. Since the seedling does not resemble the mature plant, this weed is probably being controlled by common practices more than we realize. As the plants grow and become recognizable, control with herbicides is more difficult. Further research needs to test new herbicides on sharppoint fluvellin in field situations.