CONTROL OF WILD PROSO MILLET

by
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Greenhouse and field experiments were conducted to study the influence of seeding depth on the development of the growing point of wild proso millet seedlings. The effect of position and timing of application by 5 herbicides (pendimethalin, alachor, atrazine, tridiphane and EPTC) on the control of wild proso millet was also studied.

A. Greenhouse experiment

Influence of seeding depth on the development of the growing point of wild proso millet.

Seeds of wild proso millet were planted at 6 depths (0,3,6,9,12, and 15 cm) using plot of 10 inches. Twenty five seeds per plot with 4 replications was used. Soil from O.S.U. East Farm was utilized. Watering was by subirrigation. Germination and position of the growing point were determined. The highest germination was obtained at 3 to 9 cm depth of seeding. There was less germination at the surface and at 15 cm deep (Table 1). This suggests that either non tillage or very deep tillage can help controlling the weed.

The position of the growing point was related with the seeding depth, the greater the seeding depth the smaller number of plants with growing point above surface (Table 2). This experiment was conducted under greenhouse conditions (low light intensity). However, under high light intensity, the number of plants with the growing point above soil decreased signficantly.

B. Field Experiment

This experiment was conducted at the OSU Hyslop Farm. The objective was to determine the effectiveness of a variety of herbicides on the control of wild proso millet planted at three depths in the soil. The seeding depths were 1, 4, and 7 cm. The herbicides studied are:

	HERBICIDE	RATE	TIME OF APPLICATION
1.	Pendimethalin	2	PRE
2.	Pendimethalin	2	POST
3.	Atrazine + tridiphane	1.1 + 0.5	PRE
4.	Atrazine + tridiphane	1.1 + 0.5	POST
5.	Alachlor	3.3	PRE
6.	Alachlor	3.3	POST
7.	Alachlor	2.2	PRE
8.	Alachlor	2.2	POST
9.	Atrazine + tridiphane	2.2 + 0.5	PRE
10.	Atrazine + tridiphane	2.2 + 0.5	POST
11.	EPTC	3	PPI
12.	EPTC	4.5	PPI
13.	EPTC + tridiphane	3 + 0.5	PPI
14.	Tridiphane	1	POST
15.	Check		

A split block design with 4 replications was utilized. Seeding depth was the main plot and herbicides were the subplot. The experiment was repeated twice. The first experiment was planted on May 5, 1986 and evaluated on July 17. The second experiment was planted on June 17, and evaluated August 12.

Differences in weed control at 3 seeding depths (main plots) were not significant. Control of this weed with these chemicals is not dependent upon the depth of the seed in the soil within the range of 1 to 11 cm.

There were significant differences in weed control among the chemicals evaluated. In the first experiment (Table 3), pendimethalin (2kg/ha) alachlor (3.3 kg/ha) and atrazine + tridiphane (2.2 + 0.5 kg/ha) had good control of wild proso millet when applied preemergence. However, in the second experiment (Table 4), pendimethalin (2 kg/ha) was the only treatment that showed good control. Alachlor and atrazine + tridiphane did not show good control in this experiment. These results are consistent with the results obtained in the Mid West, where control of wild proso millet has been erratic.

The most promising herbicide is pendimethalin because of the good control of wild proso millet shown in both experiments.

TABLE 1: Germination of Wild Proso Millet in different seeding depths under greenhouse conditions.

Seeding depth (cm)	Germination[1] (%)
0	12
3	54
6	52
9	45
12	32
15	6

[1] Each number is the average of 4 replications

TABLE 2. Percentage of plants showing the growing point above surface, related with the seeding depth under greenhouse conditions.

Seeding depth (cm)	Replications I	II	III	IV	Average
0	100	100	75	75	87.50
3	90	75	100	86	87.75
6	73	43	50	54	55.0
9	0	50	33	25	27.0
12	0	14	33	0	11.75
15	0	0	0	0	0.0

Table 3. Percentage of wild proso millet control under field conditions. Experiment 1: Planted May 5, 1986; evaluated, July 17, 1986.

Treatment	Seeding depth			
	1 cm	6 cm	11 cm	Average
1. Pendimethalin 2 kg/ha PRE[1]	100	100	92	97.3
2. Pendimethalin 2 kg/ha POST[2]	0	0	0	0
3. Atrazine + tridiphane 1.1 + 0.5 kg/ha PRE	46.25	36.25	42.5	41.6
4. Atrazine + tridiphane 1.0 + 0.5 kg/ha POST	0	0	15	5
5. Alachlor 3.3 kg/ha PRE	94	97.5	96.5	96
6. Alachlor 3.3 kg/ha POST	83.75	86.25	95	88.3
7. Alachlor 2.2 kg/ha PRE	0	0	0	0
8. Alachlor 2.2 kg/ha POST	0	0	12.5	4.16
9. Atrazine + tridiphane 2.2 + 0.5 kg/ha PRE	98.6	99.3	100	99.3
10. Atrazine + tridiphane 2.2 + 0.5 kg/ha POST	0	0	15	5
11. EPTC 3 kg/ha PPI[3]	92	78.75	75	81.9
12. EPTC 4.5 kg/ha PPI	40	76.25	85.75	67.3
13. EPTC + tridiphane 3 + 0.5 kg/ha PPI	83.25	73.75	89.5	82.16
14. Tridiphane 1 kg/ha POST	0	0	0	0
15. Check	0	0	0	0

[1]PRE = preemergence of wild proso millet

[2]POST = post emergence of wild proso millet

[3]PPI = preplant incorporate

Table 4. Percentage of wild proso millet control under field conditions. Experiment 2: Planted, June 17, 1986; evaluated, August 12, 1986.

Treatment	Seeding depth			
	1 cm	6 cm	11 cm	Average
1. Pendimethalin 2 kg/ha PRE[1]	97.75	99.5	99.75	99
2. Pendimethalin 2 kg/ha POST[2]	0	0	0	0
3. Atrazine + tridiphane 1.1 + 0.5 kg/ha PRE	0.5	3.75	1	1.75
4. Atrazine + tridiphane 1.0 + 0.5 kg/ha POST	0	0	1.25	0.42
5. Alachlor 3.3 kg/ha PRE	61.5	49.5	52.5	54.5
6. Alachlor 3.3 kg/ha POST	32.5	43.75	55.0	43.75
7. Alachlor 2.2 kg/ha PRE	0	0	0	0
8. Alachlor 2.2 kg/ha POST	0	0	0	0
9. Atrazine + tridiphane 2.2 + 0.5 kg/ha PRE	8.5	6.75	6.75	7.3
10. Atrazine + tridiphane 2.2 + 0.5 kg/ha POST	0	0	0	0
11. EPTC 3 kg/ha PPI[3]	4.75	7.5	2.5	4.9
12. EPTC 4.5 kg/ha PPI	1.25	0.25	5.5	2.3
13. EPTC + tridiphane 3 + 0.5 kg/ha PPI	11.5	6.75	8	8.75
14. Tridiphane 1 kg/ha POST	0	0	0	0
15. Check	0	0	0	0

[1]PRE = preemergence of wild proso millet

[2]POST = post emergence of wild proso millet

[3]PPI = preplant incorporate