

Evaluation of Ethofumesate (Nortron) and Pendimethalin (Prowl) for Weed Control in Onion Grown for Seed

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Introduction

Ethofumesate (Nortron[®]) has recently been registered for use in onions. However, the utility of this herbicide in the existing weed control program is not clear. Ethofumesate is fairly expensive for growers and may not be worth the cost of trying if it offers little improvement beyond current practices. Many herbicides that are registered for use in onion cannot be applied until the onions have two fully expanded leaves. If ethofumesate is safe on onions and it can control some broadleaf weeds, it could fill a gap in current management practices.

Butler et al. (2001) observed no injury to onion from preemergence applications of pendimethalin (Prowl[®]). However, those results were only for one field in one year. More data are needed to determine if pendimethalin is safe on onion. The objective of this research was to evaluate ethofumesate and pendimethalin alone and in combinations on onion grown for seed.

Methods and Materials

A field trial was conducted in a commercial field of onion grown for seed near Madras, Oregon. The soil type was a Madras sandy loam. The trial consisted of 8-ft by 25-ft plots arranged in randomized complete blocks replicated four times. Herbicide treatments were applied on July 24, 2007 preemergence to the onions with a CO₂-pressurized backpack sprayer delivering 20 gal/acre at 40 psi at the rates and timings shown in Table 1. The field was sprinkler irrigated and the first irrigation was on July 17, 2007. Crop injury was evaluated visually with a 0 to 100 percent rating scale. Stand counts were made in the spring by counting the number of onions per yard of row twice for the male-sterile line and twice for the pollinator line in each plot.

Results and Discussion

At the time of the August 3 and August 10 evaluations, the onions were small and injury was difficult to detect visually. At these two dates there were also too few weeds to evaluate. By September 6, the hand-weeding crew unfortunately removed all the weeds from the trial area so no evaluation of weed control could be made. Stand counts were made for both of the lines in this hybrid field because there was an obvious difference in vigor between the male-sterile and the pollinator line.

On September 6 it was clear that 0.95 lb/acre of pendimethalin had injured the onions (Table 1). Injury from ethofumesate alone was minor. The combination of ethofumesate and pendimethalin at the lower rates caused more injury than either herbicide alone. The injury recorded from both herbicides was from stunting and stand thinning. Injury

observed on September 6 persisted through the fall but was no longer visible in the spring once the onions began to grow (data not shown). However, both treatments with 0.95 lb/acre of pendimethalin reduced stand counts compared to the check for the male-sterile line. There were no differences in stand count for the pollinator line.

References

Butler, M., B. Holliday, D. Brooks, and C. Campbell. 2002. Evaluation of preemergence herbicides in seed onions. Pages 35-36 in Central Oregon Agricultural Research Center 2001 Annual Report. Special Report 1039.

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Table 1. Hybrid onion grown for seed injury and stand counts following preemergence applications of ethofumesate (Nortron) and pendimethalin (Prowl) near Madras, Oregon 2007-2008.

Treatment ¹	Rate lb/acre	Onion injury			Stand count ²	
		03/Aug/07 1 leaf ----- % visual	10/Aug/07 2 to 3 leaf -----	06/Sep/07 3 to 5 leaf -----	MS ³ ----- plants/yard	Pollinator ⁴ -----
Check	---	0	0	0	33	22
Ethofumesate	0.5	0	0	0	38	26
Ethofumesate	0.75	0	0	3	29	22
Pendimethalin	0.475	0	0	3	31	18
Pendimethalin	0.95	0	0	26	27	18
Ethofumesate + pendimethalin	0.5 + 0.475	0	0	10	31	25
Ethofumesate + pendimethalin	0.75 + 0.95	0	0	36	28	19
LSD ($P = 0.05$)		---	---	---	5	NS

¹Applied preemergence to onion on 24 July 2007. Also treated with 0.75 lb ae/acre of glyphosate to control emerged weeds. Ethofumesate = Nortron 4 SC. Pendimethalin = Prowl H₂O 3.8 CS.

²Means of two subsamples taken per plot.

³MS = male-sterile line also called “female” in hybrid production.

⁴Pollinator line also called “male” in hybrid production.