

Research Note

EVALUATION OF PREPLANT INCORPORATED CHEMICALS FOR WEED CONTROL ON ALFALFA IN A VERTISOL¹

Alfalfa (*Medicago sativa* L.) is a highly productive, nutritious, widely adapted forage species. It is not grown commercially on a large scale in the Island. The Agricultural Experiment Station is conducting research to evaluate varieties for local adaptation, resistance to pests, and agronomic characters. Weeds offer severe competition to the crop, especially at the time of its establishment.

In recent variety trials conducted at the Lajas Substation, the writer has observed that at least three hand weeding are needed to control weeds that severely compete with the legume.

The present study was conducted as a preliminary screening of herbicides for the establishment of alfalfa. The trial was established on a Vertisol, Fraternidad clay soil, at the Lajas Substation during 1978. Three registered herbicides at two rates, and another used commercially for vegetable crops, were applied preplant and immediately incorporated at the manufacturer's suggested rate for the soil type.

Herbicides were sprayed with a precision compressed-air field plot sprayer. Main plots were 22.5 m long and 2 m wide. Four liters of herbicide preparation were broadcast over each main plot at 2 kg/cm² pressure using 730308 Teejet tips.² After application, the herbicide treated plots were rototilled two inches deep to incorporate the chemicals. The check plots were also rototilled to prevent bias.

Treatments were placed in the field as follows: 1) Benefin (N-butyl-N-ethyl-a,a,a,-trifluoro-2,6-dinitro-p-toluidine) at 1.7 kg/ha a.i.; 2) EPTC (S-ethyl dipropylthiocarbamate) at 4.5 kg; 3) Trifluralin (a-a-a-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine) at 1.1 kg; 4) DCPA (dimethyl tetrachloroterephthalate) at 11.8 kg; 5) Benefin at 2.2 kg; 6) EPTC at 5.6 kg; 7) Trifluralin at 1.4 kg/ha; 8) hand-weeded check; and 9) non-weeded check.

Main plots were subdivided in three equal subplots and each one planted to a different alfalfa cultivar. Varieties were WL-311, Thor, and Moapa. Inoculated seeds were sown on February 15 in rows 30 cm apart. In an attempt to reduce loss of seed viability, since overhead irrigation was not available at planting, the area was sprayed with 1.5 kl of tap

¹ Manuscript submitted to Editorial Board December 1, 1978.

² Trade names are used solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee of equipment or materials by the Agricultural Experiment Station, U.P.R., nor is this mention a statement of preference over other similar equipment or materials not mentioned.

water using a John Bean handgun sprayer. Overhead irrigation was then applied 2 days later and weekly thereon.

Data on weed control by visual ratings and weed weights were recorded. Spot checks did not show any toxic effects that could be attributed to the preplant chemicals. Since seed germination was not uniform, precise information on herbicide toxicity to cultivars, if any, is not available. Erratic germination in main plots was probably due to lack of sufficient moisture after planting.

Table 1 presents weed weights of plots harvested on March 17 (1 mo after sowing). These data confirm visual ratings performed earlier. Weight averages for treatments and percent weed control are also presented.

TABLE 1.—Weed weights in alfalfa sub-plots, treatment averages, and percent weed control

Treatment	kg/ha a.i. ³	Weed weight of varieties			Treatment average weight kg	Weed control %
		WL-311 kg	Thor kg	Moapa kg		
Trifluralin	1.4	0.73	0.68	0.32	0.58	96.1
Trifluralin	1.1	0.91	0.91	0.45	0.76	94.8
Benefin	2.2	1.36	3.27	2.27	2.30	84.4
DCPA	11.8	1.14	4.31	2.04	2.50	83.1
Benefin	1.7	2.04	3.63	3.04	2.90	80.4
EPTC	5.6	7.35	8.31	9.76	8.47	42.6
EPTC	4.5	9.08	12.48	7.04	9.53	35.4
Non-weeded check	—	14.57	12.76	16.93	14.75	0.0

³ The hand-weeded check treatment is not included since it had been weeded twice, prior to harvest and the recording of weed weights.

Predominant weeds, in the experimental area by order of importance were *Brachiaria subquadripara*; Johnson grass (*Sorghum halepense* (L.) Pers); purple nutsedge (*Cyperus rotundus* L.); jungle-rice (*Echinochloa colonum* (L.); horse purslane (*Trianthema portulacastrum* L.); and spurge (*Euphorbia heterophylla* L.). Secondary weeds were: goose grass (*Eleusine indica* (L.); morningglory (*Ipomoea* sp.); pigweed (*Amaranthus dubius* Mart.); and niruri (*Phyllanthus niruri* L.).

The best herbicide treatment was Trifluralin and the least efficient EPTC (Eptam). DCPA, although not suggested for alfalfa weed control by the manufacturer, was similar in weed control to that of Benefin. The hand-weeded check treatment was weeded twice before other treatments were harvested for recording weed weights. These results show the capability of Trifluralin at the rate of 1.1 to 1.4 kg/ha to control weeds at the time of alfalfa establishment.

Luis Almodóvar-Vega
Crop Protection Department
Jaime Vélez-Santiago
Agronomy and Soils Department