

Soil-Applied Herbicides for Weed Control in Broccoli

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Abstract

Three commonly used herbicides for use in broccoli were effective when applied alone or in combinations as a preplant incorporated (PPI) or a preemergence (PE) application. DCPA (Dacthal®) at 10.0 lb product/A PE gave acceptable control of most weeds. Trifluralin (Treflan® 5EC) at 1.0 pt/A and bensulide (Prefar® 4EC) PPI were also effective but mustard weeds were not adequately controlled. Combinations of the herbicides at lower rates did not provide any advantage in improving weed control efficacy.

Introduction

Weed control in broccoli is difficult when trying to eliminate weeds that are within the same family (Cruciferae). Another weed problem is to eliminate volunteer melons that were grown in a rotation as the previous crop. DCPA (Dacthal®), trifluralin (Treflan®), and bensulide (Prefar®) are selective herbicides that are regularly used on a wide range of vegetable and melon crops. Application methods may vary with availability of types of equipment for soil preparation and planting procedures and irrigation practices with respect to use of sprinklers, furrow, or drip systems. The objectives of this study were to evaluate and determine effective rates of herbicides and methods of application for weed control in broccoli.

Materials and Methods

A commercial broccoli field was used to establish a replicated study to evaluate typical available herbicide treatments in Aguila, AZ. The test was a randomized complete block design with five replicates. Treatment plot size was five beds (60-inch beds) measuring the length of the field, 1,600 ft. All preplant incorporated (PPI) herbicide treatments were applied with a tractor-sprayer with flat fan nozzle tips in 15 gallons per acre of water. A lilliston cultivator was used to mechanically incorporate the herbicide after applications on the same day, October 3, 1994. Beds were shaped immediately after incorporation. Preemergence (PE) herbicide treatments were applied on the following day with the boom attached behind the planter seeding broccoli in four seedlines on the bed. The broccoli was sprinkler irrigated to germinate and establish the crop stand then subsurface drip irrigated. Weed control was rated at about 3 weeks after the first irrigation. Average weed control was calculated for each species then means were subjected to analysis using Duncan's Multiple Range Test.

Results and Discussion

At 3 weeks after the first irrigation, all of the treatments gave better than 90% control of *Malva parviflora* (cheeseweed), *Phalaris minor* (canarygrass), and *Brassica nigra* (black mustard) (Table.). *Chenopodium album* (lambsquarters) and *Sisymbrium irio* (London rocket) were also controlled by Dacthal® at 10.0 lb product/A PE. Treflan® treatments marginally controlled London rocket (80%) in this test. Prefar® and Dacthal® treatments at lower rates or in combinations did not provide acceptable control of London rocket. Volunteer melons were present and were not

adequately controlled by any of the PPI or PE herbicide treatments.

Dacthal® at a high rate applied PE and incorporated with the sprinkler irrigation provided acceptable weed control of the broadest spectrum of weeds in this test. Volunteer melon control appears to require further investigation. Most of the PPI herbicide treatments were not adequate in providing acceptable control of London rocket, a cruciferous weed, however, other weeds appeared to be adequately controlled. Broccoli as not injured by any of the treatments.

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Table. Soil-applied herbicides for weed control in broccoli in Aguila, AZ. (Umeda and Gill).

Treatment	Application Timing	Rate (Product/A)	% CSI	% Weed Control					
				SSYIR	MALPA	PHAMI	BRSNI	CHEAL	MELON
Untreated check			0	0 e	0 b	0 b	0 d	0 b	0 b
Treflan® 5EC	PPI	1.0 pt	0	80 b	91 a	93 a	91 c	88 a	84 a
Treflan® 5EC + Dacthal® 75W	PPI	0.8 pt + 4.8 lb	0	80 b	93 a	95 a	92 bc	88 a	84 a
Prefar® 4EC + Dacthal® 75W	PPI	4.8 pt + 4.8 lb	0	66 c	91 a	95 a	93 abc	89 a	83 a
Dacthal® 75W	PPI	7.6 lb	0	54 d	92 a	95 a	92 bc	88 a	83 a
Prefar® 4EC	PPI	4.0 qt	0	58 d	93 a	94 a	94 ab	88 a	84 a
Dacthal® 75W	PE	10.0 lb	0	89 a	95 a	95 a	95 a	92 a	80 a

PPI = Preplant incorporated with lilliston cultivator; PE = Preemergence

SSYIR = London rocket (*Sisymbrium irio*), MALPA = cheeseweed (*Malva parviflora*),

PHAMI = canarygrass (*Phalaris minor*), BRSNI = black mustard (*Brassica nigra*),

CHEAL = lambsquarters (*Chenopodium album*), Melon = volunteer cantaloupe

PPI treatments applied on 10/3/94, broccoli planted on 10/4/94, PE treatments applied on 10/6/94,

Sprinkler irrigated on 10/6/ 94 until crop stand established then drip irrigated.

Means within a column followed by the same letter are not significantly different by Duncan's MRT at the 5% level.