

EVALUATION OF HERBICIDES UNDER PLASTIC MULCH IN BELL AND HABANERO PEPPER. Joseph G. Masabni, Assistant Professor, Department of Horticulture, University of Kentucky, Princeton, KY 42445.

Clomazone and trifluralin are labeled for use in pepper. However, labels don't specifically allow or prohibit their use under plastic before transplanting. An experiment was conducted in Princeton KY to evaluate clomazone and trifluralin safety and performance when applied under plastic before transplanting Bell and Habanero peppers.

Habanero pepper showed more initial injury than Bell peppers for all similar herbicide treatments. Injury ratings ranged from 30-50% for Habanero and 20-30% for bell pepper. Both pepper cultivars later recovered from the initial herbicide injury. No treatment differences were observed for Habanero pepper yields. Total yields at end of harvest for Habanero peppers ranged from 315 to 946 fruits/plot and 3.1 to 6.5 kg/plot. Clomazone applied alone or tank-mixed with trifluralin resulted in significantly higher yields from the untreated control of Bell pepper in terms of fruit number and weight per plot. The high rate of trifluralin 1.12 kg ai/ha (treatment 10) was not significantly different from the untreated control in terms of total yield (kg/plot) of Bell pepper. Trifluralin 1.12 kg ai/ha rate applied alone (treatment 10) appears to have injured both pepper cultivars resulting in reduced yields comparable to the untreated control. Trifluralin 0.9 kg ai/ha had no negative effect on either cultivar.

Introduction

Clomazone and trifluralin are preemergence herbicides for the control of many broadleaves and grasses. Both are labeled for use in pepper when incorporated before transplanting pepper. Most vegetable growers in Kentucky grow transplanted peppers on plastic mulch and struggle with weeds growing through the planting hole. Although the clomazone and trifluralin labels don't specifically prohibit their use under plastic, the labels don't clearly allow that use either. Growers would like to apply herbicides under plastic.

An experiment was conducted at the Princeton research station to evaluate clomazone and trifluralin and efficacy and safety when applied pre-transplant under the plastic mulch on Bell and Habanero peppers.

Materials and Methods

Herbicides were applied using a CO₂-pressurized backpack sprayer with a two 11002-nozzle boom calibrated to spray a 1.8 m band at 30 psi and 5.1 kph. The nozzles were set at 20.3 cm above ground to obtain good spray overlap and complete spray coverage. Plots were 0.9 m x 3 m long. The experimental design consisted of a randomized complete block with 3 replications.

The pre-transplant (PRT) treatments were applied on 15 May 2007. All treatments were applied early in the morning when the average wind speed was 3.2 kph, and soil and air temperatures were 15.5C and 16.6C, respectively. Herbicides were sprayed on the top of newly formed beds, after which the plastic was laid down. Pepper plants were transplanted 4 hrs after completion of herbicide sprays. One row of each pepper cultivar was transplanted on each bed, with 30.4 cm spacing within plants and between the 2 rows.

Visual weed control ratings were made on 23 May (8 days after treatment or 8 DAT), 12 June (28 DAT) and 22 June (38 DAT). Ratings were on a scale of 1 to 10, where 1 = no control or no injury observed and 10 = complete kill or no weeds present. A rating of 7 (70-75% control) or more is considered a commercially acceptable value. Bell peppers were harvested 5 times between 10 July and 13 August. Habanero were about 1 week later in harvest. Habanero peppers were harvested 5 times from 19 July to 21 August.

Results and Discussion

At 8 DAT, Habanero pepper showed more injury than bell peppers for all similar herbicide treatments. Injury ratings ranged from 30-50% for Habanero and 20-30% for bell pepper ([Table 1](#)). Although this injury was not economically significant, it was statistically significant compared to the untreated or handweeded control. By 28 DAT, both pepper cultivars recovered slightly from the initial herbicide injury. Bell pepper injury ranging from 10-20% and was not significantly different from the controls. Habanero injury was still statistically significant at this date and ranged from 20-40%. Both pepper plants continued growth and development by 28 DAT with the injury rating reflecting some stunting and white bleaching in clomazone-containing treatments.

By 38 DAT, few weeds were found in all herbicide treatments (3 to 10) compared to the untreated control. At this date, surviving honeyvine milkweeds were severely stunted and bleached white. By 38 DAT, both pepper cultivars have completely recovered from all herbicide treatment. At harvest completion ([Table 2](#)), clomazone applied alone or in tank mixes with trifluralin resulted in significantly higher yields for both pepper cultivars in terms of fruit number and weight per plot, except for treatment 3. Yields ranged from 8.4-9.9 kg/plot for treatments 4, 5, 6, and 8. Low rate of clomazone 0.7 kg ai/ha (treatment 3) and the high rate of trifluralin 1.12 kg ai/ha (treatment 10) were not significantly different from the untreated control. Treatment 3 (clomazone 0.7 kg ai/ha) resulted in the highest total number and fruit weight of Habanero pepper at harvest completion. Trifluralin 1.12 kg ai/ha rate applied alone (treatment 10) appears to have injured both pepper cultivars resulting in reduced yields comparable to the untreated control. Trifluralin 0.9 kg ai/ha had no negative effect on either cultivar.

This study clearly indicated that clomazone at 0.7 or 1.4 kg ai/ha and trifluralin at 0.9 kg ai/ha are viable options for use under plastic in plasticulture production, even when plants are transplanted within 4 hours of herbicide application.