

# Dacthal® Herbicide Rate Comparison for Preemergence Weed Control in Onions

K. Umeda, C. Fredman

## Abstract

DCPA (Dacthal®) herbicide was applied preemergence (PE) to the soil surface after onion planting and no crop injury was observed for rates of 5.3, 7.5, and 10.5 lb. a.i./A at one of two locations. Dacthal® gave good control of London rocket and cheeseweed (90 -94%) at one location and marginal control at the second location (79-85%). Dacthal® did not exhibit a rate response to control the two weeds common to both locations. The lower rate of Dacthal® did not differ in efficacy compared to higher rates to completely control lambsquarters and nettleleaf goosefoot. All rates of Dacthal® marginally controlled yellow sweetclover and other mustard weeds present. Dacthal® provided adequate weed control to allow onion stand establishment.

## Introduction

Weed control in onions is difficult because of a broad spectrum of winter annual weeds that compete with the crop during the period of trying to establish a stand. DCPA (Dacthal®) herbicide is commonly used preemergence (PE) applied to the soil surface to control most grass weeds and some broadleaved weeds. A range of rates is commonly used depending on the soil type, anticipated weed population pressure, and economics. The objectives of these field studies were to compare and determine effective use rates of Dacthal® for dry bulb onion weed control.

## Materials and Methods

Two small plot field studies were conducted within commercially grown onion fields near Surprise, AZ and near Waddell, AZ. Both fields were seeded to dry bulb onions on 40-inch beds with 4 to 6 seedlines per bed on November 2 and 3, 1994. Preemergence (PE) herbicide treatments were replicated four times in a randomized complete block design. Each plot consisted of two beds measuring 25 feet in length. Dacthal® 75WP herbicide treatments were 5.3, 7.5 and 10.5 lb. a.i./A. All treatments were applied with a hand-held boom having four flat fan 8002 nozzles spaced 20-inches apart and delivered in 18 gallon per acre of water pressurized with a CO<sub>2</sub> backpack sprayer at 45 psi. Herbicide treatments were applied at Surprise on November 7 during the morning hours with air temperature at 64°F, no wind, and high overcast with 50% cloud cover. The soil was dry and the first furrow irrigation followed after applications. Near Waddell, herbicide treatments were applied on November 2 with air temperature at 74°F, no wind, and high scattered clouds. The soil was dry and first furrow irrigation was 3 days later. Weeds present at Surprise were *Chenopodium album* (lambsquarters), *Chenopodium murale* (nettleleaf goosefoot), *Sisymbrium irio* (London rocket), *Malva parviflora* (cheeseweed), and various winter annual grasses. At Waddell, weeds included London rocket, cheeseweed, *Melilotus* sp. (yellow sweetclover), and different mustard species (*Brassica* sp.). Visual weed control and onion injury evaluations were made at approximately 11 weeks after treatment.

## Results and Discussion

Results for observed onion injury and weed control for Dacthal® applied PE at Surprise, AZ are presented in Table 1.

No onion injury was observed for any rate of Dacthal® ranging from 5.3 to 10.5 lb. a.i./A. With moderate weed population pressure, Dacthal® at all rates provided good weed control (>90%) of all weeds present relative to the untreated check. Few escape weeds of London rocket and cheeseweed were present in plots treated with all rates of Dacthal® and lambsquarters and goosefoot were effectively controlled. A rate response from low to high rates was not evident for Dacthal® efficacy against broadleaved weeds in this test. Few annual grass weeds were present and control appeared to increase slightly with increased Dacthal® rates.

At Waddell, AZ, weed population pressure was light to moderate and only weed control was evaluated (Table 2.). Marginal weed control was observed at all rates of Dacthal® against London rocket and different mustard sp., cheeseweed, and yellow sweetclover. Again, a rate response from low to high rates of Dacthal® was not observed in this test.

At both locations, Dacthal® at rates ranging from 5.3 to 10.5 lb. a.i./A gave marginally acceptable to good weed control to allow onion stand establishment. Under light to moderate weed population pressures, Dacthal® at 5.3 lb. a.i./A was as effective as 10.5 lb. a.i./A. Results from Surprise, AZ, indicated that Dacthal® was effective against grass weeds, lambsquarters and goosefoot with slightly less activity against London rocket and cheeseweed. The Waddell, AZ location also indicated that Dacthal® was somewhat weak against broadleaved weeds.

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Table 1. Dacthal® herbicide rate comparison for preemergence weed control in onions near Surprise, AZ.

| Treatment       | Rate (lb a.i./A) | % Injury | % Weed Control |       |       |       |       |
|-----------------|------------------|----------|----------------|-------|-------|-------|-------|
|                 |                  |          | CHEAL          | CHEMU | SSYIR | MALPA | GRASS |
| Untreated check |                  | 0        | 0              | 0     | 0     | 0     | 0     |
| Dacthal®        | 5.3              | 0        | 99             | 99    | 90    | 91    | 93    |
| Dacthal®        | 7.5              | 0        | 99             | 99    | 91    | 94    | 95    |
| Dacthal®        | 10.5             | 0        | 99             | 99    | 90    | 91    | 96    |

Dacthal® applied preemergence on November 7, 1994.

Weed control rated on January 23, 1995.

CHEAL = lambsquarters (*Chenopodium album*), CHEMU = nettleleaf goosefoot (*Chenopodium murale*),

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

GRASS = various annual grasses

Table 2. Dacthal herbicide rate comparison for preemergence weed control in onions near Waddell, AZ.

| Treatment       | Rate (lb a.i./A) | % Weed Control |       |       |       |
|-----------------|------------------|----------------|-------|-------|-------|
|                 |                  | SSYIR          | MALPA | MEUOF | BRASS |
| Untreated check |                  | 0              | 0     | 0     | 0     |
| Dacthal         | 5.3              | 79             | 83    | 78    | 83    |
| Dacthal         | 7.5              | 81             | 85    | 85    | 88    |
| Dacthal         | 10.5             | 79             | 82    | 80    | 86    |

Dacthal® applied preemergence on November 2, 1994.

Weed control rated on January 20, 1995.

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

MEUOF = yellow sweetclover (*Melilotus sp.*), BRASS = mustard (*Brassica sp.*)