

Response of cauliflower to several herbicides. Timothy W. Miller. (Washington State University, Mount Vernon, WA 98273) Weeds are of considerable importance to cauliflower producers. Trifluralin is used on nearly all commercial cauliflower fields in Washington state, but control of several common weed species by that product is nearly always incomplete, forcing producers to use expensive hand labor to achieve adequate weed control. Of particular concern is shepherd's-purse, which, in addition to competing with the crop, releases seeds that frequently stick to the surface of the curd, detracting from cauliflower appearance and reducing its market value.

Several herbicides were tested for efficacy and selectivity in cauliflower during 1999 in a commercial production cauliflower field near Mount Vernon, WA. Plots were established June 18 in 'Rivella' cauliflower. Plots were 10 feet long, with one cauliflower row per plot. Preemergence treatments were applied June 22 and postemergence treatments July 15; a CO₂-pressurized backpack sprayer delivering 41 gpa at 37 psi was used for both application timings (Table 1). The two dominant weed species in the plots were henbit and shepherd's-purse. Cauliflower injury and general weed control were visually estimated July 21 and August 12. The experimental design was a randomized complete block with three replicates. A general linear models procedure was used to analyze the data. Means were separated using Fisher's Protected LSD.

Cauliflower injury July 21 was unacceptably high for thiazopyr, azafenidin, and preemergence sulfentrazone (100%), pendimethalin (98%), and dimethenamid (68%)(Table 2). By August 21, weed control from the remaining treatments was > 90% with *S*-metolachlor and the high rates of pyridate and postemergence sulfentrazone (Table 2). Cauliflower treated either with the high rate of postemergence sulfentrazone or the low rate of pyridate produced significantly heavier yields than did the untreated check, but no treatments significantly increased cauliflower head number (Table 2).

Table 1. Application data.

| <u>Preemergence</u> | <u>Postemergence</u> |
|--------------------------|---------------------------|
| 1:45 p.m., June 22, 1999 | 8:30 a.m., July 15, 1999 |
| No crop emergence | Crop 2 to 3 leaves |
| No weed emergence | Weeds 2 to 4 inches tall |
| 100% cloud cover | 50% cloud cover |
| Winds 2 to 5 mph from SW | Winds 0 to 2 mph from SE |
| Air temp. = 57 F | Air temp. = 66 F |
| Soil temp (4 in.) = 50 F | Soil temp. (4 in.) = 51 F |
| Relative humidity = 45% | Relative humidity = 59% |
| Soil surface moist | No dew, soil surface dry |

Table 2. Weed control and cauliflower injury as affected by herbicide treatment.

| Treatment ^a | Timing ^a | Rate | Crop injury | | Weed control | | Head number | Head weight |
|------------------------|---------------------|-------|---------------|---------------|---------------|---------------|-------------|-------------|
| | | | 7/21 | 8/12 | 7/21 | 8/12 | | |
| | | lb/A | ----- % ----- | ----- % ----- | ----- % ----- | ----- % ----- | no./10 ft. | lbs/10 ft. |
| Pendimethalin | PRE | 1.5 | 98 | 62 | 100 | 98 | — | — |
| Clopyralid | PRE | 0.25 | 0 | 0 | 50 | 10 | 9.0 | 8.5 |
| Thiazopyr | PRE | 0.5 | 100 | 100 | 99 | 99 | — | — |
| Fluroxypyr | PRE | 0.25 | 2 | 3 | 85 | 60 | 10.0 | 8.9 |
| Dimethenamid | PRE | 1.0 | 68 | 60 | 99 | 99 | 2.3 | 1.6 |
| Azafenidin | PRE | 0.025 | 100 | 100 | 93 | 90 | — | — |
| S-Metolachlor | PRE | 0.95 | 5 | 5 | 98 | 96 | 10.3 | 8.7 |
| Sulfentrazone | PRE | 0.25 | 100 | 100 | 100 | 99 | — | — |
| Clopyralid | POST | 0.125 | 0 | 0 | 52 | 40 | 6.3 | 5.9 |
| Clopyralid | POST | 0.25 | 2 | 5 | 40 | 20 | 9.7 | 6.7 |
| Pyridate | POST | 0.5 | 3 | 0 | 85 | 85 | 13.0 | 13.3 |
| Pyridate | POST | 1.0 | 12 | 0 | 93 | 93 | 8.7 | 9.9 |
| Sulfentrazone | POST | 0.125 | 0 | 0 | 85 | 73 | 10.7 | 10.9 |
| Sulfentrazone | POST | 0.25 | 3 | 0 | 90 | 92 | 11.3 | 15.5 |
| Clopyralid | POST | 0.125 | 3 | 0 | 87 | 77 | 10.7 | 11.6 |
| + sulfentrazone | POST | 0.125 | | | | | | |
| Clopyralid | POST | 0.125 | 5 | 0 | 87 | 85 | 10.0 | 10.3 |
| + pyridate | POST | 0.5 | — | — | — | — | — | — |
| Untreated check | — | — | 0 | 0 | 0 | 0 | 9.7 | 6.9 |
| LSD _{0.05} | — | — | 7 | 23 | 14 | 21 | 4.4 | 5.4 |
| r ² | — | — | 0.99 | 0.93 | 0.94 | 0.92 | 0.83 | 0.78 |
| C.V. | — | — | 15.2 | 53.3 | 10.7 | 17.5 | 36.9 | 46.7 |

^aPRE = preemergence, applied 6/22/99; POST = postemergence, applied 7/15/99.