

Pea herbicide management trial at Waseca, MN - 1999. Becker, Roger L., Vincent A. Fritz, James B. Hebel, Douglas W. Miller, and Bradley D. Kinkaid. The objective of this experiment was to evaluate weed control and pea injury with several soil applied and postemergence herbicides. This study was conducted on a Webster clay loam soil with pH 6.4. A randomized complete block design with three reps was utilized. Plot size was 10 feet by 20 feet. 'Columbia' peas were seeded at 550,000 plants/A on May 28, 1999. Herbicide application data are provided below. Peas were harvested on July 27, 1999 from a 42 by 110 inch area within each plot. Weed control and pea harvest data are provided in the tables below.

#### Application Data

| Treatment        | PPI     | PRE           | POST              |
|------------------|---------|---------------|-------------------|
| Date             | 5/27/99 | 5/28/99       | 6/20/99           |
| Air Temp (°F)    | 71      | 74            | 72                |
| Sky              | cloudy  | partly cloudy | partly sunny-hazy |
| Wind (mph)       | SE 8    | SE 12         | SE 14             |
| Peas             |         |               |                   |
| Size (inch)      | --      | --            | 3-6               |
| Stage            | --      | --            | 4-5 nodes         |
| Gift             |         |               |                   |
| Size (inch)      | --      | --            | 0.5-3.0           |
| Stage            | --      | --            | 1-3 leaf collar   |
| Cocb             |         |               |                   |
| Size (inch)      | --      | --            | 3-5               |
| Colq, Rrpw, Vele |         |               |                   |
| Size (inch)      | --      | --            | 1.5-2             |
| Rainfall before  |         |               |                   |
| Application      |         |               |                   |
| Week 1 (inch)    | 1.40    | 1.13          | 0.43              |
| Rainfall after   |         |               |                   |
| Application      |         |               |                   |
| Week 1 (inch)    | 0.50    | 0.50          | 0.24              |
| Week 2 (inch)    | 0.77    | 1.73          | 2.15              |

Weed pressure was heavy in part due to the late planting date because of wet weather in May. Pea growth was not as vigorous as would have been the case with an earlier May planting. Weed pressure of giant foxtail was very heavy, while common cocklebur and velvetleaf were heavy. Weed pressure was moderate for populations of redroot pigweed and scattered, light populations of eastern black nightshade were present, mostly in the second replication.

Giant foxtail control was poor to moderate with preplant-incorporated soil applied trifluralin, pendimethalin, clomazone and with preemergence applications of sulfentrazone and metolachlor. Postemergence applications of imazamox, imazethapyr, and quizalofop provided moderate to excellent control of giant foxtail. Excellent control of giant foxtail was also obtained with the combination of preplant incorporated trifluralin and a sequential, preemergence application of clomazone compared with standard preplant incorporated treatments.

Giant foxtail emergence preceded that of broadleaf weeds and unless controlled, prevented their emergence. Therefore where foxtail control was poor, decreased broadleaf weed populations that would have required control by a herbicide may have resulted in numerical control rating values higher than would have been expected.

Common cocklebur pressure was heavy and relatively uniform throughout the trial area. Imazamox and imazethapyr, and bentazon all provided excellent control of common cocklebur. Control of cocklebur with CGA-248757 was moderate to good while control with trifluralin, pendimethalin, and metolachlor was poor. Clomazone and sulfentrazone provided moderate control of common cocklebur. There was a trend for decreased control of cocklebur when clomazone was applied as the 3ME formulation preemergence compared with the 4EC formulation applied preplant incorporated.

Velvetleaf control was moderate with trifluralin, pendimethalin, and metolachlor at the July rating date and progressed to poor control with these treatments by harvest date (data not shown). CGA-248747, bentazon, imazamox, imazethapyr, sulfentrazone, and clomazone all provided good to excellent control of velvetleaf.

Redroot pigweed pressure was light and variable, however there were clear indications that clomazone allowed redroot pigweed escapes providing only moderate control compared with other options. Metolachlor also provided only moderate control although trends showed better performance compared with clomazone. Eastern black nightshade pressure was present as a light, scattered infestation concentrated mostly in the second replication. A rating was noted only when Eastern black nightshade was visible (data not presented). As would be anticipated, dinitroanilines or clomazone result in poorer control of eastern black nightshade than other broadleaf herbicide options including metolachlor.

Pea yields were taken too late for quality with tenderometer readings ranging from 150 to 196. However, the tenderometer values were significantly lower when herbicide treatments gave complete control of grasses and broadleaf weeds as with imazamox at 0.032 lb and imazethapyr at 0.047 lb/A rates. Yields were confounded by variable stand and growth differences due to environment, i.e. the late planting date. There were no significant differences in yield. (Department of Agronomy and Plant Genetics, University of Minnesota, St. Paul).

Table 1. Pea herbicide weed management trial at Waseca, MN - 1999. (Becker et al.)

| Treatment <sup>1</sup>                           | Rate <sup>1</sup><br>(lb ai/A)  | Weed control (7/13) |      |      |      |
|--|---------------------------------|---------------------|------|------|------|
|  |                                 | Gift                | Cocb | Rrpw | Vele |
|  |                                 | ----- (%) -----     |      |      |      |
| <u>Preplant Incorporated</u>                     |                                 |                     |      |      |      |
| Trifluralin                                      | 0.75                            | 65                  | 54   | 95   | 75   |
| Pendimethalin                                    | 1.5                             | 62                  | 40   | 98   | 83   |
| Clomazone  | 0.375                           | 40                  | 62   | 68   | 93   |
| Clomazone  | 0.5                             | 53                  | 72   | 50   | 93   |
| Clomazone + trifluralin                          | 0.375 + 0.375                   | 56                  | 69   | 98   | 93   |
| <u>Preplant Incorporated and (Preemergence)</u>  |                                 |                     |      |      |      |
| Trifluralin + (clomazone)                        | 0.375 + (0.375)                 | 74                  | 56   | 98   | 90   |
| Trifluralin + (clomazone)                        | 0.5 + (0.5)                     | 92                  | 60   | 91   | 95   |
| <u>Preemergence</u>                              |                                 |                     |      |      |      |
| Clomazone  | 0.5                             | 51                  | 35   | 70   | 90   |
| Sulfentrazone                                    | 0.31                            | 19                  | 75   | 96   | 96   |
| Metolachlor & safener                            | 3.0                             | 78                  | 59   | 82   | 82   |
| <u>Postemergence</u>                             |                                 |                     |      |      |      |
| Imazamox + NIS <sup>2</sup> + 28%N <sup>3</sup>  | 0.032 + 0.25% + 1.25%           | 92                  | 98   | 99   | 99   |
| Imazethapyr + NIS + 28%N                         | 0.047 + 0.25% + 1.25%           | 85                  | 99   | 99   | 99   |
| CGA 248757 + imazamox + NIS + 28%N               | 0.0036 + 0.032 + 0.25% + 1.25%  | 92                  | 99   | 99   | 99   |
| CGA 248757 + imazethapyr + NIS + 28%N            | 0.0036 + 0.047 + 0.25% + 1.25%  | 77                  | 99   | 99   | 99   |
| Quizalofop + COC <sup>4</sup>                    | 0.096 + 1.0%                    | 98                  | 0    | 0    | 0    |
| <u>Preplant Incorporated and (Postemergence)</u> |                                 |                     |      |      |      |
| Trifluralin + (CGA 248757 + COC)                 | (0.75) + (0.0045 + 1.25%)       | 53                  | 81   | 99   | 99   |
| Trifluralin + CGA 248757 + bentazon + COC)       | (0.75) + (0.0036 + 1.0 + 1.25%) | 59                  | 99   | 99   | 99   |
| Trifluralin + (bentazon + COC)                   | (0.75) + (1.0 + 1.25%)          | 60                  | 99   | 99   | 99   |
| Handweeded check                                 |                                 | 99                  | 99   | 99   | 99   |
| Weedy check                                      |                                 |                     |      |      |      |
| LSD (0.05)                                       |                                 | 13                  | 37   | 23   | ns   |

<sup>1</sup> Treatments and rates in parenthesis represent a separate application.

<sup>2</sup> NIS = Class Preference nonionic surfactant.

<sup>3</sup> 28%N = 28% UAN fertilizer solution.

<sup>4</sup> COC = Class Crop Oil Concentrate.

Table 2. Pea herbicide weed management trial at Waseca, MN - 1999. (Becker et al.)

| Treatment <sup>3</sup>                           | Rate <sup>3</sup><br>(lb ai/A)  | Pea injury (7/13) |                   |                   | Pea harvest        |       |
|--|---------------------------------|-------------------|-------------------|-------------------|--------------------|-------|
|  |                                 | Chlorosis         | S.R. <sup>1</sup> | G.R. <sup>2</sup> | Tend. <sup>4</sup> | Yield |
|  |                                 | ----- (%) -----   |                   |                   | (cwt/A)            |       |
| <u>Preplant Incorporated</u>                     |                                 |                   |                   |                   |                    |       |
| Trifluralin                                      | 0.75                            | 0                 | 0                 | 0                 | 195                | 23.4  |
| Pendimethalin                                    | 1.5                             | 0                 | 0                 | 0                 | 193                | 22.9  |
| Clomazone  | 0.375                           | 0                 | 0                 | 0                 | 185                | 11.5  |
| Clomazone  | 0.5                             | 0                 | 0                 | 0                 | 191                | 18.7  |
| Clomazone + trifluralin                          | 0.375 + 0.375                   | 0                 | 0                 | 0                 | 194                | 17.8  |
| <u>Preplant Incorporated and (Preemergence)</u>  |                                 |                   |                   |                   |                    |       |
| Trifluralin + (clomazone)                        | 0.375 + (0.375)                 | 0                 | 0                 | 0                 | 192                | 21.8  |
| Trifluralin + (clomazone)                        | 0.5 + (0.5)                     | 0                 | 0                 | 0                 | 194                | 24.2  |
| <u>Preemergence</u>                              |                                 |                   |                   |                   |                    |       |
| Clomazone  | 0.5                             | 0                 | 0                 | 0                 | 190                | 17.1  |
| Sulfentrazone                                    | 0.31                            | 0                 | 0                 | 0                 | 188                | 12.0  |
| Metolachlor & safener                            | 3.0                             | 0                 | 0                 | 0                 | 196                | 19.2  |
| <u>Postemergence</u>                             |                                 |                   |                   |                   |                    |       |
| Imazamox + NIS <sup>5</sup> + 28%N <sup>6</sup>  | 0.032 + 0.25% + 1.25%           | 10                | 0                 | 0                 | 150                | 21.8  |
| Imazethapyr + NIS + 28%N                         | 0.047 + 0.25% + 1.25%           | 0                 | 0                 | 0                 | 168                | 25.9  |
| CGA 248757 + imazamox + NIS + 28%N               | 0.004 + 0.032 + 0.25% + 1.25%   | 10                | 0                 | 0                 | 161                | 26.2  |
| CGA 248757 + imazethapyr + NIS + 28%N            | 0.004 + 0.047 + 0.25% + 1.25%   | 8                 | 3                 | 10                | 173                | 19.2  |
| Quizalofop + COC <sup>7</sup>                    | 0.096 + 1.0%                    | 0                 | 0                 | 0                 | 196                | 24.1  |
| <u>Preplant Incorporated and (Postemergence)</u> |                                 |                   |                   |                   |                    |       |
| Trifluralin + (CGA 248757 + COC)                 | (0.75) + (0.0045 + 1.25%)       | 3                 | 0                 | 0                 | 183                | 16.9  |
| Trifluralin + CGA 248757 + bentazon + COC)       | (0.75) + (0.0036 + 1.0 + 1.25%) | 0                 | 0                 | 0                 | 173                | 14.7  |
| Trifluralin + (bentazon + COC)                   | (0.75) + (1.0 + 1.25%)          | 0                 | 0                 | 0                 | 182                | 17.3  |
| Handweeded check                                 |                                 | 0                 | 13                | 0                 | 189                | 25.1  |
| Weedy check                                      |                                 | 0                 | 0                 | 0                 | 188                | 11.1  |
| <u>LSD (0.05)</u>                                |                                 | 4                 | 4                 | ns                | 12                 | ns    |

<sup>1</sup> S.R. = Stand reduction.<sup>2</sup> G.R. = Growth reduction.<sup>3</sup> Treatments and rates in parenthesis represent a separate application.<sup>4</sup> Tend. = Tenderometer reading (relative scale of measure).<sup>5</sup> NIS = Class Preference nonionic surfactant.<sup>6</sup> 28%N = 28% UAN fertilizer solution.<sup>7</sup> COC = Class Crop Oil Concentrate.