

2006 Insecticide Efficacy against Flea Beetles on Canola Trial A

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Materials and Methods

Trials assessing the different insecticide treatments were conducted in research plots located at the North Central Research Extension Center (REC) in Minot and the Langdon REC in Langdon. *Brassica napus* cv. Hyola 357 Magnum was seeded on 5 May in Carrington, 8 May in Minot, and 12 May in Langdon. The seeding rate was approximately 14-17 pure live seeds per sq. foot. A RCB experimental design with four replicates was used. Experimental plots were 3.5-4.1 ft. (7 rows) x 20-22 ft. Treatments included: untreated check, Tribune (a fungicide seed treatment), Helix Xtra / thiamethoxam (insecticide-fungicide seed treatment), Prosper 400 / clothianidin (insecticide-fungicide seed treatment), and Tribune plus Warrior (a foliar pyrethroid insecticide application for late-season aphid control). To evaluate flea beetle injury, assessments were taken at approximately 14, 21-22, and 28 Days After Planting (DAP) using the following rating scheme: 1 = 0-3 pits per seedling; 2 = 4-9 pits per seedling; 3 = 10-15 pits per seedling; 4 = 16-25 pits per seedling; 5 = >25 pits per seedling; and 6 = dead. Percent coverage (% of land area in plot that was covered with canola seedlings) was estimated on 28 DAP. Roundup (1 pt./acre) + AMS was applied for weed control early in the season. Plots were harvested on 3 August in Carrington, 4 August in Minot, and 23 August in Langdon. Variables were subjected to ANOVA and means compared using Fisher's PLSD at the 5% significance level.

Results and Discussion

Flea Beetle Injury Ratings and Yield (Tables 1-3):

Flea beetle populations were generally low and slightly higher at Langdon, followed by Carrington, and then Minot during 2006. The foliar insecticide, Warrior, was not applied at any location due to the lack of aphid populations. So, the last treatment, Tribune + Warrior, was identical to Tribune only treatment. All insecticide seed treatments had a significantly lower injury rating than the untreated check, Tribune, and Tribune + Warrior, regardless of the location. There were also no significant differences between the Helix Xtra and Prosper 400 for all assessment dates of injury ratings. For percent coverage, insecticide seed treatments had significantly higher percent coverage than the untreated check, Tribune, and Tribune + Warrior at Minot and Carrington. At Langdon, insecticide seed treatments had significantly higher percent coverage than the untreated check and Tribune, but not the Tribune + Warrior. This indicates that the insecticide seed treatment increased early plant vigor over the untreated seed. At Minot, there were no significant differences in yield, probably due to the lower flea beetle populations. At Carrington, only Prosper 400 had a significantly higher yield than the untreated check, Tribune, and Tribune + Warrior. At Langdon, Helix Xtra and Prosper 400 had a significantly higher yield than the untreated check, Tribune, and Tribune + Warrior. Regardless, insecticide seed treatments averaged 464 lb/acre more than the untreated checks: 383 lb/acre for Helix xtra and 544 lb/acre for Prosper 400. These results demonstrate the importance of using an insecticide-fungicide seed treatment for protection against flea beetles and soil-borne diseases in canola production.

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Table 1. Minot.

| Treatment/ formulation | Rate g AI/100 kg (unless noted) | 14 DAP ^a Rating 1 1-6 ^b | 22 DAP ^a Rating 2 1-6 ^b | 28 DAP ^a Rating 3 1-6 ^b | 28 DAP ^a % Coverage | Yield lb/acre |
|---------------------------|---------------------------------------|---|---|---|-----------------------------------|------------------|
| Untreated check | | 4.6 a | 4.3 a | 3.9 a | 36 a | 1271 |
| Tribune | 34 | 4.5 a | 4.3 a | 3.8 a | 41 ab | 1273 |
| Helix XTra | 400 | 1.0 b | 1.0 c | 1.0 c | 85 c | 1672 |
| Prosper 400 | 400 | 1.0 b | 1.0 c | 1.3 bc | 83 c | 1904 |
| Tribune + Warrior | 34 + 1.92 fl oz/A | 4.5 a | 3.3 b | 2.3 c | 59 b | 1477 |
| LSD(P=.05) | | 0.9 | 0.9 | 1.0 | 19.8 | NS |
| CV | | 18.6 | 20.9 | 26.9 | 21.1 | 22.4 |
| Grand Mean | | 3.1 | 2.8 | 2.4 | 60.8 | 1513 |

Means within a column followed by the same letter are not significantly different (ANOVA, Fisher's PLSD, P<0.05).

^a DAP = Days After Planting

^b Injury Rating: 1= 0-3 pits per seedling, 2= 4-9 pits per seedlings; 3= 10-15 pits per seedling; 4= 16-25 pits per seedling; 5= >25 pits per seedling; and 6= dead seedling.

Table 2. Carrington.

| Treatment/ formulation | Rate g AI/100 kg (unless noted) | 14 DAP ^a Rating 1 1-6 ^b | 21 DAP ^a Rating 2 1-6 ^b | 28 DAP ^a Rating 3 1-6 ^b | 28 DAP ^a % Coverage | Yield lb/acre |
|---------------------------|---------------------------------------|---|---|---|-----------------------------------|------------------|
| Untreated check | | 2.4 a | 3.5 b | 4.1 a | 43 a | 1712 a |
| Tribune | 34 | 2.1 a | 3.8 ab | 3.8 a | 45 a | 1925 a |
| Helix XTra | 400 | 1.0 b | 1.1 c | 1.0 b | 68 b | 1995 ab |
| Prosper 400 | 400 | 1.0 b | 1.3 c | 1.3 b | 69 b | 2329 b |
| Tribune + Warrior | 34 + 1.92 fl oz/A | 2.5 a | 4.3 a | 4.8 b | 40 a | 1768 a |
| LSD(P=.05) | | 0.9 | 0.7 | 1.0 | 12.5 | 369 |
| CV | | 31.9 | 16.5 | 21.9 | 15.3 | 12.3 |
| Grand Mean | | 1.8 | 2.8 | 2.9 | 52.8 | 1948 |

Means within a column followed by the same letter are not significantly different (ANOVA, Fisher's PLSD, P<0.05).

^a DAP = Days After Planting

^b Injury Rating: 1= 0-3 pits per seedling, 2= 4-9 pits per seedlings; 3= 10-15 pits per seedling; 4= 16-25 pits per seedling; 5= >25 pits per seedling; and 6= dead seedling.

Table 3. Langdon.

| Treatment/ formulation | Rate g AI/100 kg (unless noted) | 14 DAP ^a Rating 1 1-6 ^b | 21 DAP ^a Rating 2 1-6 ^b | 28 DAP ^a Rating 3 1-6 ^b | 28 DAP ^a % Coverage | Yield lb/acre |
|---------------------------|---------------------------------------|---|---|---|-----------------------------------|------------------|
| Untreated check | | 2.5 a | 4.0 a | 2.9 a | 72 a | 1669 a |
| Tribune | 34 | 2.0 a | 3.6 a | 2.3 ab | 81 a | 1847 ab |
| Helix XTra | 400 | 1.0 b | 2.1 b | 1.0 c | 96 b | 2133 b |
| Prosper 400 | 400 | 1.0 b | 2.3 b | 1.0 c | 95 b | 2053 b |
| Tribune + Warrior | 34 + 1.92 fl oz/A | 2.0 a | 2.1 b | 2.0 b | 85 ab | 1873 ab |
| LSD(P=.05) | | 0.5 | 1.1 | 0.9 | 13.7 | 305 |
| CV | | 16.9 | 26.0 | 30.4 | 10.4 | 10.4 |
| Grand Mean | | 1.7 | 2.8 | 1.8 | 86.0 | 1915 |

Means within a column followed by the same letter are not significantly different (ANOVA, Fisher's PLSD, P<0.05).

^a DAP = Days After Planting

^b Injury Rating: 1= 0-3 pits per seedling, 2= 4-9 pits per seedlings; 3= 10-15 pits per seedling; 4= 16-25 pits per seedling; 5= >25 pits per seedling; and 6= dead seedling.