BROCCOLI: *Brassica oleracea* L. ‘Arcadia’

Green peach aphid; *Myzus persicae* (Sulzer)
Cabbage aphid; *Brevicoryne brassicae* (L.)

CONTROL OF AFHIDS ON BROCCOLI, 1991:

Broccoli was direct seeded in double-row beds on 15 Jan at the Yuma Valley Agricultural Center, Yuma, AZ. Each plot measured 2 beds by 75 ft long, with an 8 inch spacing between rows and a 40 inch spacing between beds. A single bed was left untreated between each plot. Plants were thinned within rows at 6 inch intervals on 9 Feb. Plots were arranged in a randomized complete block design with 4 replications. Granular insecticide treatments at planting were applied by placing the granules just below the seed line with a Gandy granular applicator mounted on the planter. Plots were subsequently irrigated on 16 Jan. Layby applications of granular treatments were made on 14 Mar by placing the material into the soil just below the roots through shanks mounted to the Gandy granular applicator. Plots were subsequently irrigated on 14 Mar. Aphid populations were assessed on 24 Mar and 8 Apr by randomly removing 10 plants from each replicate and placing them in Berlese funnels. All alate and apterous aphids extracted from the foliage were counted. Data were analyzed with ANOVA and Ryan’s Q test.

Aphid populations were very heavy throughout most of the growing season. It was estimated that *M. persicae* accounted for greater than 85% of the total population of aphids. There were no significant differences in aphid numbers among treatments prior to the application of layby treatments. No differences in the number of alate aphids were detected among treatments during the test. On 21 Mar (64 days after planting, and 7 days after layby treatments were applied), numbers of apterous aphids were significantly lower in the high rate, layby NTN treatment. On 8 Apr (25 days after layby), both layby treatments of NTN contained significantly fewer apterous aphids per plant than the untreated control. Aphid populations in NTN treatments applied at planting were not significantly different from the untreated check on either sample date. No phytotoxicity was observed.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Time of application</th>
<th>Rate (oz AI)</th>
<th>21 Mar Alate</th>
<th>21 Mar Apterous</th>
<th>8 Apr Alate</th>
<th>8 Apr Apterous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Di-Syston 15 G</td>
<td>Planting</td>
<td>7.400</td>
<td>2.62a</td>
<td>193.90b</td>
<td>14.80a</td>
<td>112.45ab</td>
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<tr>
<td>NTN 33893 2.5 G</td>
<td>Planting</td>
<td>0.054</td>
<td>3.50a</td>
<td>240.97b</td>
<td>18.80a</td>
<td>208.10a</td>
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<tr>
<td>NTN 33893 2.5 G</td>
<td>Planting</td>
<td>0.108</td>
<td>1.92a</td>
<td>156.37ab</td>
<td>20.05a</td>
<td>165.85a</td>
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<tr>
<td>NTN 33893 2.5 G</td>
<td>Layby</td>
<td>0.054</td>
<td>3.33a</td>
<td>202.65b</td>
<td>15.20a</td>
<td>53.60bc</td>
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<tr>
<td>NTN 33893 2.5 G</td>
<td>Layby</td>
<td>0.108</td>
<td>2.97a</td>
<td>23.97a</td>
<td>15.05a</td>
<td>7.95c</td>
</tr>
<tr>
<td>Untreated</td>
<td>—</td>
<td>—</td>
<td>1.40a</td>
<td>238.70b</td>
<td>11.10a</td>
<td>205.65a</td>
</tr>
</tbody>
</table>

Means within columns followed by the same letter are not significantly different (P = 0.05; Ryan’s Q Test).

BROCCOLI: *Brassica oleracea* L. ‘Commander’

Cabbage looper (CL); *Trichoplusia ni* (Hübner)
Turnip aphid; *Lipaphis erysimi* (Kaltenbach)

CONTROL OF LEPIDOPTEROUS PESTS ON BROCCOLI, FALL, 1991:

‘Commander’ cultivar broccoli plants were transplanted on 6 Sep 91 into a Bernow series fine, sandy-loam soil at the Wes Watkins A.R.E.C., Lane, OK. Plots were 15 ft long and 2 rows wide with 10 ft buffers within rows and one row planted with turnips and collards between plots. Rows were spaced 3 ft apart and plants were spaced 1 ft apart within rows. A randomized complete block design with four replications was used. Conventional cultural practices were used and recommended rates of fertilizer were applied. Samplings for CL and aphids were conducted on 19, 24, 25 Sep, 1, 3, 14, and 24 Oct. CL were sized as small (instar 1 & 2) or large (instar 3 & 4). All insecticides were applied with a CO₂-powered backpack sprayer calibrated at 44.6 gal/acre. Each insecticide treatment was applied on 20, 27 Sep, and 7 Oct.

CL populations were low during the test, with a seasonal average of 2.71 larvae per five plants in untreated plots. Differences on individual dates were not significant among treatments for small and large CL larvae. Brigade, Asana XL, F 56701, and Centari at 1.0 lb/acre had the lowest levels of larvae on most dates. Seasonal means for small CL larvae were significantly lower in Asana XL and F 56701 treated plots. Aphid populations did not begin to evolve until late in the season. Once colonization began, Brigade, Asana XL, and F 56701 provided the best control. Generally, Pyrethroid products provided the greatest levels of control while moderate reductions in CL populations were observed with B.t. products. No phytotoxicity was observed with any of the treatments.
CABBAGE: *Brassica oleracea* L. ‘Super Elite’

Imported cabbageworm (ICW); *Pieris rapae* (L.)

Cabbage looper (CL); *Trichoplusia ni* (Hübner)

Diamondback moth (DBM); *Plutella xylostella* (L.)

Cabbage aphid; *Brevicoryne brassicae* (L.)

Lady beetle; *Coccinellidae*

Lacewings; *Neuroptera*

Spiders; *Aranaeae*

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**EVALUATION OF MICROBIAL AND INSECTICIDE COMBINATIONS FOR THE CONTROL OF CABBAGE PESTS IN MINNESOTA, 1991:**

This test was conducted on the University of Minnesota Agricultural Experiment Station at Rosemount in cabbage transplanted on 14 Jun. Plots were two rows on 36" centers, 40 ft long, and separated by 7 ft alleys on the sides and 10 ft alleys at the ends. They were arranged in a randomized complete block design with 4 replications. A Spirit sprayer with 5 hollow-cone (TX-10) nozzles/2 rows, delivering 27 gal/acre at 45 psi, was used to treat each plot. Two plots (MVP & Ambush early) received 5 sprays while the remaining plots received only 4. Treatments were applied 27 Jun (MVP & Ambush early plots only), 17, 24, 31 Jul, and 14 Aug. Evaluations of larval numbers, aphids, and beneficials were made on 13 Aug by randomly selecting 5 heads/plot. Damage and marketability ratings were made on 29 Aug by randomly harvesting 5 heads/plot.

Overall, *B.t.* and *B.t.* combinations provided comparable control to conventional insecticides like Ambush and Lanate. All treatments were significantly lower than the untreated control for total larval counts. All treatments, with the exception of TD 2321 at the high rate, provided significantly more marketable heads than the control. No phytotoxicity was observed.