**November 2010 Progress Report to the Cranberry Institute**

**Title:** Pest management tools for PNW cranberries.

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**Research objectives:**

1. Evaluate efficacy of rynaxypyr, HGW86, MBI-203, MBI-205, NNI-2302, and novaluron insecticides applied through chemigation for control of fireworm.
2. Evaluate the herbicides quinclorac (4l and 75 DF formulations), MBI-005, fomesafen, DPX-MAT 28, indaziflam and rimsulfuron for control of perennial broadleaf weeds in cranberries.
3. Assess field applications of *Metarhizium anisopliae* (strain F52) for blackvine weevil and potential girdler control (pending site locations).
4. Assess the value of mid-late bloom treatments of Indar, Abound and Evito as a means to achieve fresh fruit keeping quality without risk of Bravo residue.

**Results:**

*New insecticide efficacy - chemigation/fireworm:*
Our earlier research suggested that novaluron, dpx 2y45, HGW 86 and spinetoram had reasonable activity against BHFW when applied through a chemigation system. These results, however, were confounded by both the lack of good sites and grower overspray. Our research in 2010 compared the efficacy of chemigated applied Spinetoram (two rates), Alticor, HGW 86, Novaluron, MBI-205, Assail and Intrepid for BHFW control. Seven different trials were conducted on fireworm in growers' fields. Treatments were applied using simulated chemigation to six replicated plots, 10' x 10'. Efficacy was based on percentage of live larvae several days post-treatment. Dpx 2y45, HGW 86 and Spinetoram provided adequate efficacy for first generation fireworm, while Novaluron and MBI-205 did not (Tables 1 & 2). Additional studies on later generations confirmed consistent efficacy of HGW 86, Alticor and both rates of Spinetoram (Tables 3-7). We also obtained efficacy with Intrepid and Assail. Adding Bravo fungicide as a sticker did not improve efficacy of Intrepid (Table 4), whereas applying Intrepid in split treatments reduced efficacy (Table 7).

**Table 1. First generation blackheaded fireworm control with chemigation in 2010 (Beckerle Farm)**

| | 3 DAT | | | | 7 DAT | | | |
|---|---|---|---|---|---|---|---|---|
| Treatment | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive |
| Control | 0.8 | 1 | 0 | 3 | 1.3 | 2 | 0.5 | 3.8 |
| Diazinon AG600 (chemigation) - 2 qt/a | 0 | 0.3 | 0.8 | 0.3 | 0 | 0 | 0 | 0 |
| Spinetoram (chemigation) - 3.25 qt/a | 0.3 | 0.8 | 1.3 | 1 | 0 | 0 | 0 | 0 |
| Spinetoram (chemigation) – 6.5 oz/a | 0 | 0.5 | 0.5 | 0.5 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Dpx 2y45 (dpx 2y45) - 0.066 lb ai/a | 0 | 1.5 | 1 | 1.5 | 0 | 0 | 0 | 0 |
| HGW 86 (HGW 86) (chemigation) 10.1 fl oz /a | 0.5 | 0.5 | 1.3 | 1 | 0.3 | 0 | 0 | 0.3 |
| Novaluron (chemigation) 12 oz/a | 0.5 | 1 | 0.5 | 3.3 | 0 | 0.3 | 1 | 1.3 |
| MBI-205 3% @ 100 gpa | 0.5 | 0.8 | 0.5 | 1.5 | 0.5 | 1 | 1.3 | 2.8 |
| LSD (P=.05) | 0.81 | 1.33 | 1.29 | 1.53 | 1.17 | 1.15 | 0.65 | 1.77 |
| Treatment Prob(F) | 0.3889 | 0.643 | 0.4784 | 0.0037 | 0.3233 | 0.0124 | 0.0012 | 0.0006 |

**Table 2. First generation blackheaded fireworm control with chemigation in 2010 (McPhail Farm)**

| | 3 DAT | | | | 7 DAT | | | |
|---|---|---|---|---|---|---|---|---|
| Treatment | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive |
| Control | 0.5 | 2.5 | 4 | 7 | 0.5 | 0.8 | 1.5 | 2.8 |
| Diazinon AG600 (chemigation) - 2 qt/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spinetoram (chemigation) - 3.25 oz/a | 0 | 0.5 | 0 | 0.5 | 0 | 0.5 | 0 | 0.5 |
| Spinetoram (chemigation) – 6.5 oz/a | 0 | 0.3 | 0 | 0.3 | 0 | 0 | 0 | 0 |
| Dpx 2y45 - 0.066 lb ai/a | 0 | 1.5 | 0 | 1.5 | 0.3 | 0.3 | 0 | 0.5 |
| HGW 86 (chemigation) 10.1 fl oz /a | 1 | 1.3 | 0 | 2.3 | 0.8 | 0 | 0 | 0.8 |
| Novaluron (chemigation) 12 oz/a | 0.3 | 3.3 | 3.5 | 7 | 0.3 | 0.8 | 1.5 | 2.5 |
| MBI-205 3% @ 100 gpa | 0.8 | 3.5 | 3.3 | 7.5 | 0.8 | 0.8 | 2.3 | 3.8 |
| LSD (P=.05) | 0.96 | 2.12 | 1.63 | 3.69 | 0.93 | 1 | 1.34 | 1.43 |
| Treatment Prob(F) | 0.2283 | 0.0115 | 0.0001 | 0.0002 | 0.4401 | 0.412 | 0.0048 | 0.0001 |

**Table 3. Second generation blackheaded fireworm control with chemigation in 2010 (Pierson Farm- study one)**

| | 3 DAT | | | | 7 DAT | | | |
|---|---|---|---|---|---|---|---|---|
| Treatment | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive |
| Control | 0.5 | 0 | 3.8 | 4.3 | 1 | 0 | 0.8 | 1.8 |
| Assail 6.9 oz/a | 0.3 | 0.3 | 1.3 | 1.8 | 0 | 0.3 | 0.3 | 0.5 |
| Spinetoram (chemigation) – 6.5 oz/a | 0 | 0 | 0 | 0 | 0 | 0.3 | 0 | 0.3 |
| Dpx 2y45 - 0.066 lb ai/a | 0 | 0.3 | 0 | 0.3 | 0 | 0.3 | 0 | 0.3 |
| HGW 86 (chemigation) 10.1 fl oz /a | 0 | 0 | 0 | 0 | 0.3 | 0 | 0.5 | 0.8 |
| LSD (P=.05) | 0.8 | 0.51 | 2.04 | 2.37 | 0.95 | 0.42 | 0.83 | 0.53 |
| Treatment Prob(F) | 0.5767 | 0.6114 | 0.0067 | 0.0087 | 0.1656 | 0.4449 | 0.2754 | 0.0002 |

**Table 4. Second generation blackheaded fireworm control with chemigation in 2010 (Pierson Farm- study two)**

| | 3 DAT | | | |
|---|---|---|---|---|
| Treatment | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive |

| | | | | |
|---|---|---|---|---|
| CONTROL | 17 | 2.8 | 0 | 19.8 |
| Spinetoram (chemigation) – 6.5 oz/a | 2.8 | 0 | 0 | 2.8 |
| Intrepid 16 oz/a | 4 | 0 | 0 | 4 |
| Intrepid 16 oz/a + Bravo | 2.8 | 0 | 0 | 2.8 |
| LSD (P=.05) | 3.72 | 3.88 | 0 | 4.01 |
| Treatment Prob(F) | 0.0001 | 0.3382 | 1 | 0.0001 |

**Table 5. Third generation blackheaded fireworm control with chemigation in 2010 (Evergreen Farms study one)**

| | 2 DAT | | | | 6 DAT | | | | 10 DAT | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive |
| CONTROL | 6.3 | 7.8 | 8.8 | 22.8 | 8.8 | 9.3 | 19 | 37 | 5 | 6 | 12.3 | 23.3 |
| Spinetoram – 6.5 oz/a | 0.5 | 0.5 | 0.3 | 1.3 | 0 | 0.3 | 0 | 0.3 | 0 | 0 | 0 | 0 |
| Spinetoram 3.25 qt/a | 4 | 4.5 | 0.8 | 9.3 | 0.3 | 0.5 | 0.5 | 1.3 | 0.3 | 0 | 0.3 | 0.5 |
| Intrepid 16 oz/a | 4.5 | 3.5 | 0.5 | 8.5 | 0.3 | 0 | 0.5 | 0.8 | 0 | 0 | 0 | 0 |
| LSD (P=.05) | 7.2 | 5.28 | 2.6 | 9.5 | 3.5 | 4.5 | 7.2 | 13.4 | 0.6 | 3.2 | 3.4 | 3.9 |
| Treatment Prob(F) | 0.38 | 0.07 | .0001 | .004 | .0007 | .003 | .0005 | .0003 | .0001 | .005 | .0001 | .0001 |

**Table 6. Third generation blackheaded fireworm control with chemigation in 2010 (Evergreen Farms study two).**

| | 2 DAT | | | | 4 DAT | | | | 7 DAT | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive |
| Control | 3 | 5 | 19 | 0.5 | 8 | 9.8 | 13.8 | 31.5 | 1.8 | 3.5 | 4.3 | 9.5 |
| Spinetoram – 6.5 oz/a | 2.8 | 5.8 | 0.3 | 10 | 0.5 | 0 | 0.3 | 0.8 | 0.3 | 0 | 0 | 0.3 |
| Spinetoram 3.25 qt/a | 2.3 | 2 | 0.5 | 10.3 | 0.3 | 1.5 | 0 | 1.8 | 0 | 0.3 | 0 | 0.3 |
| Intrepid 16 oz/a | 2.8 | 6.8 | 5.3 | 7 | 2.5 | 6 | 1 | 9.5 | 0 | 0 | 0 | 0 |
| LSD (P=.05) | 4.9 | 6.5 | 7.2 | 5.2 | 3.2 | 2.7 | 1.8 | 6.0 | 0.7 | 1.4 | 2.6 | 3.9 |
| Treatment Prob(F) | 0.9 | 0.43 | .0007 | .007 | .001 | .0001 | .0001 | .0001 | .001 | .0008 | .01 | 0.001 |

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| **Table 7. Third generation blackheaded fireworm control with chemigation in 2010 (Evergreen Farms study three).** | | | | |
|---|---|---|---|---|
| | 5 DAT | | | |
| Treatment | 1-2 inst | 3-4 inst | 5-6 inst | Total Alive |
| Control | 3.5 | 3.3 | 6.5 | 13.3 |
| Spinetoram (chemigation) – 6.5 oz/a with washoff | 0 | 0.5 | 0 | 0.5 |
| Spinetoram twice (chemigation) – 3.25 oz/a w/ no washoff + 3.25 oz/a in 4 hrs with washoff | 0 | 0 | 0 | 0 |
| Intrepid twice (chemigation) 8 oz/a w no washoff _ 8 oz/a in 4 hrs with washoff | 1 | 3.3 | 0.5 | 4.8 |
| LSD (P=.05) | 2.12 | 3.26 | 3.18 | 7.22 |
| Treatment Prob(F) | 0.014 | 0.0927 | 0.0029 | 0.0084 |

*Perennial weed control – new herbicides: G*eneral efficacy and crop safety of fomesafen, MAT 28, indaziflam, and flumioxazin was assessed. Comparison were made to quinclorac and rimsulfuron, Callisto and an untreated control. Treatments were applied throughout the early growing season. All herbicides were applied with a surfactant and ~ 40 gpa spray volume. Fomesafen, MAT 28, indaziflam, and flumioxazin all resulted in too much crop damage to considered useful herbicides for cranberries (Tables 8-13). Comparisons of different formulations of quinclorac (75% DF vs. 4 lb/gallon liquid) and rates of rimsulfuron for control of several of the problematic weed species in cranberry beds in the PNW were also made. (Tables 10, 11, 14-21). Both formulations of quinclorac and rimsulfuron were efficacious for numerous weed species on cranberry beds. There were no major effects of quinclorac or rimsulfuron on yield in the year of treatment or in the year following treatment. Rimsulfuron appear to reduce flower bud set.

| **Table 8. Effect of indaziflam and Mat 28 on Pilgrim vines treated 6/2/10 during early hook.** | | |
|---|---|---|
| | Phytotoxicity rating 1=none, 5=dead | estimated crop 1=none,5=200 bbl/a |
| Treatment | 8/17/2010 | |
| indaziflam 1.1 oz ai/a | 3.9 | 1 |
| Mat 28 1 oz ai/a | 3.2 | 1.3 |
| Control | 1 | 3.3 |
| LSD (P=.05) | 0.85 | 0.89 |
| Treatment Prob(F) | 0.0015 | 0.0036 |

**Table 9. Effect of fomesafen, indaziflam, Mat 28, and Callisto + Quinclorac on Pilgrim vines treated 4/30/10 during early roughneck.**

| | % control yellow weed | |
|---|---|---|
| Treatment | 6/7/2010 | 8/4/2010 |
| Name | 2 | 3 |
| Control | 0 | 0 |
| (fomesafen) 0.5 pt/a | 63 | 8 |
| (fomesafen) 0.25 pt/a | 50 | 8 |
| Mat 28 1 oz ai/a | 57 | 33 |
| (indaziflam) 1.1 ai/a | 93 | 77 |
| Callisto 8 oz/a + Quinclorac 16 oz/a | 50 | 25 |
| LSD (P=.05) | 22.01 | 31.09 |
| Treatment Prob(F) | 0.0001 | 0.0044 |

**Table 10. Effect of indaziflam, Mat 28, and Quinclorac on yellow weed treated in 2010.**

| | % yellow weed control | |
|---|---|---|
| Treatment | 8-Apr | 19-Aug |
| Control | 0 | 0 |
| CS AA10717 (indaziflam) 1 oz ai.a 6/3 | 63.3 | 94.3 |
| Mat 28 1 oz ai/a 6/3 | 50 | 65 |
| Quinclorac 0.75 lb ai/a 6/3 & 6/28 | 41.7 | 48.3 |
| Quinclorac 1.5 lb ai/a 6/3 | 55 | 56.7 |
| LSD (P=.05) | 33.97 | 23.74 |
| Treatment Prob(F) | 0.0185 | 0.0002 |

**Table 11. Effect of fomesafen, indaziflam, and Mat 28 applied at late dormant (4/1) and early rough neck (6/3) on Bergmans.**

| | 17-Aug | | |
|---|---|---|---|
| Treatment | phytotoxicity rating 1=none, 5=dead | estimated crop 1=none, 5= 200 bbl/a | bbl/ac |
| Reflex 1 pt/a 4/1 | 1.2 | 2.3 | |
| indaziflam 1.1 oz/ai/a 4/1 | 1.3 | 2.5 | |
| Quinclorac 16 oz/a 4/1 | 1.2 | 2.3 | 41 |
| MAT 28 1 oz ai/a 4/1 | 1.8 | 1.2 | 11 |
| Reflex 1 pt/a 6/3 | 1.2 | 2.8 | |
| indaziflam 1.1 oz/ai/a 6/3 | 2.8 | 1 | |
| Quinclorac 16 oz/a 6/3 | 1 | 3.3 | 66 |
| MAT 28 1 oz ai/a 6/3 | 2.8 | 1 | 12 |
| control | 1 | 3 | 47 |
| LSD (P=.05) | 0.5 | 0.6 | 21 |
| Treatment Prob(F) | 0.0001 | 0.0001 | 0.0012 |

| **Table 12. Effect of indaziflam and Mat 28 on Pilgrims vine treated 6/3/10 during early roughneck.** | | |
|---|---|---|
| | 17-Aug | |
| Treatment | phytotoxicity rating 1=none, 5=dead | estimated crop 1=none, 5= 200 bbl/a |
| indaziflam 1.1 oz ai/a 6/3 | 3.9 | 1 |
| Mat 28 1 oz/a 6/3 | 3.2 | 1.3 |
| Control WHITE | 1 | 3.3 |
| LSD (P=.05) | 0.85 | 0.89 |
| Treatment Prob(F) | 0.0015 | 0.0036 |

| **Table 13. Effect of indaziflam rate on Pilgrims vine treated 4/30/10 during bloom.** | | | |
|---|---|---|---|
| | | 17-Aug | |
| | | phytotoxicty rating 1=none, 5=dead | estimated crop 1=none, 5= 200 bbl/a |
| Treatment | Rate (oz ai/a) | | |
| Control | 0 | 1 | 3 |
| indaziflam | 0.25 | 2 | 1.8 |
| indaziflam | 0.5 | 3.3 | 1.5 |
| Indaziflam | 0.75 | 4 | 1.1 |
| Indaziflam | 1.1 | 4 | 1 |
| LSD (P=.05) | | 1.6 | 0.98 |
| Treatment Prob(F) | | 0.011 | 0.0106 |

| **Table 14. Efficacy of herbicides for control of yellow weed on cranberry beds in 2010.** | |
|---|---|
| Treatment | % control yellow weed 8/19/10 |
| Control | 0 |
| Quinclorac 0.75 lb ai/a 5/27 & 6/28 | 48.3 |
| Quinclorac 1.5 lb ai/a 5/27 | 56.7 |
| LSD (P=.05) | 23.74 |
| Treatment Prob(F) | 0.0002 |

| **Table 15. Effect of Quinclorac formulations and timings on yellow weed control and cranberry yield in 2010.** | | |
|---|---|---|
| Treatment | % control yellow weed 8/19/10 | Yield (bbl/ac) |
| Quinclorac DF 0.75 lb ai/a 6/7 & 6/20 | 72.5 | 81.5 |
| Quinclorac EC0.75 lb ai/a 6/7 & 6/20 | 65 | 63.4 |
| Quinclorac DF 0.75 lb ai/a 6/7 & 7/8 | 60 | 90.6 |
| Quinclorac EC 0.75 lb ai/a 6/7 & 7/8 | 60 | 95.1 |
| LSD (P=.05) | 42.3 | 25.25 |
| Treatment Prob(F) | 0.0342 | 0.1296 |

| **Table 16. Effect of herbicides sprayed in 2009 on control of yellow weed and yield in cranberry beds in 2009 and 2010.** | | | | |
|---|---|---|---|---|
| | % control yellow weed | | Yield (bbl/ac) | |
| Treatment | 7/14/2009 | 8/19/2010 | 2009 | 2010 |
| Control | 33 | 0 | 39 | 38 |
| Rimsulfuron 4 oz/a 2009 | 43 | 53 | 89 | 49 |
| Quinclorac & Callisto 8 oz/a each 2009 | 47 | 100 | 89 | 87 |
| Rimsulfuron2 oz/ac + Quinclorac & Callisto 8 oz/a each 2009 | 43 | 97 | 13 | 48 |
| LSD (P=.05) | 38 | 48 | 63 | 23 |
| Treatment Prob(F) | 0.839 | 0.007 | 0.062 | 0.004 |

| **Table 17. Efficacy of herbicides for control on assorted weeds in cranberry beds in 2010.** | | | | | | |
|---|---|---|---|---|---|---|
| | % control 8/18/10 | | | | | |
| Treatment | Yellow weed | Lotus | Fireweed | Marsh St. John's Wort | Annual Bluegrass | Sourdock |
| Control | 0 | 0 | 0 | 0 | 0 | 0 |
| Quinclorac 75DF 0.75 lb a/a 4/30 & 6/7 | 98.3 | 100 | 33.3 | 93.3 | 90 | 90 |
| Quinclorac 4L 0.75 lb a/a 4/30 & 6/7 | 98.3 | 100 | 81.7 | 50 | 46.7 | 21.7 |
| Rimsulfuron 4 oz/a 4/30 & 6/7 | 99.3 | 99.3 | 96.7 | 56.3 | 96.3 | 85 |
| Quinclorac 75DF 1.5 lb a/a 4/30 | 86.7 | 100 | 100 | 16.7 | 18.3 | 16.7 |
| Quinclorac 75DF 1.5 lb a/a 6/30 | 60 | 73.3 | 83.3 | 37.5 | 16.7 | 66.7 |
| LSD (P=.05) | 10.97 | 34.4 | 49.85 | 43.45 | 36.33 | 41.18 |
| Treatment Prob(F) | 0.0001 | 0.0004 | 0.0063 | 0.0116 | 0.0005 | 0.0026 |

| **Table 18. Effect of herbicides on yellow weed, flower bud set and yield of cranberry beds in 2010** | | | |
|---|---|---|---|
| Treatment | % yellow weed control 8/19/10 | Rating for flower bud set for 2011 (1=none, 5=100%) | Yield (bbl/ac) |
| Control | 0 | 3.7 | 218 |
| Quinclorac 75DF 16 oz/a 5/11 & 6/7 | 76.7 | 3.7 | 178 |
| Quinclorac 4L 16 oz/a 5/11 & 6/7 | 75 | 4 | 228 |
| Rimsulfuron4 oz/a 5/11 & 6/7 | 91.7 | 2.8 | 65 |
| LSD (P=.05) | 9.27 | 0.9 | 134 |
| Treatment Prob(F) | 0.0001 | 0.0814 | 0.0817 |

| Table 19. Effect of herbicides on cranberry phytotoxicity and yield in 2010. | | |
|---|---|---|
| Treatment | Crop phytotoxicity rating (1=none,5=dead) 8/17/10 | Yield (bbl/ac) |
| Control | 1 | 46.8 |
| Quinclorac 8 oz/a 4/1 | 1.2 | 40.8 |
| Mat 28 1 oz a/a 4/1 | 1.8 | 10.6 |
| Quinclorac 8 oz/a 6/3 | 1 | 66.4 |
| Mat 28 1 oz ai/a 6/3 | 2.8 | 12.1 |
| LSD (P=.05) | 0.53 | 21.21 |
| Treatment Prob(F) | 0.0001 | 0.0012 |

| Table 20. Effect of Rimsulfuron and Quinclorac timing on yellow weed control and cranberry yield in 2010. | | |
|---|---|---|
| Treatment | Yellow weed % control 8/19/10 | Yield (bbl/ac) |
| Control | 0 | 70.9 |
| Rimsulfuron 2 oz/ac - 6/3 & 6/23 | 0 | 70.9 |
| Rimsulfuron 2 oz/ac - 6/3 & 7/23 | 0 | 68.4 |
| Quinclorac 8 oz/a - 6/3 & 6/26 | 88.8 | 93.5 |
| Quinclorac 8 oz/a - 6/3 & 7/23 | 95.5 | 68.2 |
| LSD (P=.05) | 4.98 | 41.24 |
| Treatment Prob(F) | 0.0001 | 0.6386 |

| Table 21. Efficacy of herbicides for control of marsh arrowgrass on cranberry beds in 2010. | | |
|---|---|---|
| | Marsh arrowgrass % control 8/20/10 | Crop phytotoxicity rating (1=none,5=dead) 8/20/10 |
| Control | 0 | 1 |
| Rimsulfuron2oz/a twice | 20 | 1 |
| Rimsulfuron4 oz/ac twice | 60 | 1 |
| Quinclorac 1.35 lb/a twice | 5 | 1.5 |
| 2,4 d-G 20 lbs twice | 5 | 1 |
| LSD (P=.05) | 51.26 | 0.47 |
| Treatment Prob(F) | 0.0256 | 0.2394 |

*Metarhizium anisopliae for weevi:l* No data was collected, as the registrant wasn't able to supply product for research.

*Alternative fungicides for fruit rots:* . Mid-bloom treatments of Indar + Abound or Evito were compared to an untreated control or typical grower treatment (Bravo at set, followed by Dithane in 2 weeks), or a combination of grower treatment plus mid bloom Indar +Abound or Evito. Treatments were applied on four Stevens beds and three Pilgrim beds. For both varieties/studies there was not consistent trend in yield or field rot (tables 22 & 23). There was a trend on several beds for higher yield and lower field rot with a combination of grower treatments and Abound + Indar during bloom. This difference, however, was usually not statistical significant. Evito by itself or in combination with the grower fungicide treatments didn't appear to show any consistent treatment effect. Data collection and analysis for fruit storage rot is pending.

**Table 22. Efficacy of fungicide and fungicide timing on yield and field rot in Pilgrim cranberry beds in 2010.**

| | | bbl/ac total | | | bbl/ac marketable | | | % field rot | | |
|---|---|---|---|---|---|---|---|---|---|---|
| treatment | | p 3 | p 7 | j | p 3 | p7 | j | p 3 | p 7 | j |
| 1 | untreated control | 173 | 200 | 143 | 149 | 186 | 142 | 13.4 | 6.6 | 1.4 |
| 2 | Abound+ Indar twice during bloom | 183 | 186 | 164 | 160 | 178 | 160 | 12.4 | 3.4 | 2 |
| 3 | Evito twice during bloom | 147 | 207 | 156 | 124 | 166 | 153 | 16 | 5.1 | 1.7 |
| 4 | Bravo @ set + Manzate in 2 wks | 187 | 197 | 147 | 170 | 184 | 145 | 9.1 | 5.3 | 0.7 |
| 5 | treatment 2 + treatment 4 | 212 | 233 | 153 | 189 | 227 | 151 | 10.6 | 1.7 | 1.3 |
| 6 | treatment 3 + treatment 4 | 191 | 239 | 190 | 165 | 229 | 188 | 12.8 | 3.3 | 0.5 |
| LSD (P=.05) | | 45 | 73 | 48 | 37 | 81 | 45 | 5.4 | 3.6 | 2.1 |
| Treatment Prob(F) | | 0.12 | 0.63 | 0.40 | 0.04 | 0.49 | 0.35 | 0.18 | 0.03 | 0.68 |

**Table 23. Efficacy of fungicide and fungicide timing on yield and field rot in Stevens cranberry beds in 2010.**

| | bbl/ac total | | | | bbl/ac marketable | | | | % field rot | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment | c1 | s1 | m1 | s5 | c1 | s1 | m1 | s5 | c1 | s1 | m1 | s5 |
| grower treatment | 87 | 242 | 91 | 166 | 83 | 223 | 70 | 124 | 2.2 | 6.5 | 22.9 | 13.0 |
| grower treatment + Abound Indar twice during bloom | 109 | 189 | 113 | 138 | 109 | 178 | 98 | 104 | 1.4 | 4.1 | 9.7 | 7.6 |
| grower treatment + Evito twice during bloom | 76 | 201 | 108 | 180 | 76 | 190 | 89 | 142 | 0.6 | 4.5 | 16.4 | 8.3 |
| LSD (P=.05) | 52 | 74 | 55 | 71 | 52 | 68 | 45 | 49 | 1.8 | 3.8 | 7.9 | 9.8 |
| Treatment Prob(F) | 0.38 | 0.29 | 0.64 | 0.44 | 0.37 | 0.35 | 0.41 | 0.26 | 0.22 | 0.34 | 0.01 | 0.43 |