

ONTARIO PROCESSING VEGETABLE GROWERS RESEARCH SUMMARY RESULTS - 2003

THE DEVELOPMENT OF PEST MANAGEMENT STRATEGIES FOR INSECTS AND PLANT DISEASES IN PROCESSING VEGETABLES.

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CABBAGE

CONTROL OF CABBAGE FOLIAR INSECTS USING NEW Btk FORMULATED PRODUCTS I.

CONCLUSIONS: The commercial inorganic insecticide standard DECIS 5.0EC significantly reduced the number of foliage insects feeding on cabbage resulting in the lowest foliage damage. The newly developed Btk product from the London laboratory outperformed the commercial Btk product DIPEL 2XDF when used with the surfactant Reddy-It. None of the other tested additives when mixed with the new Btk product from London significantly improved insect control in cabbage when compared to the commercial DIPEL 2XDF with Agral 90. All of the additives when used with the new Btk biological insecticide provided at least equal control to DIPEL 2XDF offering an alternative product choice.

CONTROL OF CABBAGE FOLIAR INSECTS USING A NEW Btk FORMULATED PRODUCTS II.

CONCLUSIONS: Neither of the Btk materials used in this test, whether it was the new product being tested or the commercial formulation of DIPEL 2XDF effectively controlled cabbage insects. None of the additives, surfactants that were being tested to determine if they could improved the level of control of the test Btk materials proved beneficial. The only product that provided cabbage insect control was the commercial standard DECIS 5.0 EC.

CONTROL OF CABBAGE FOLIAR INSECTS USING NEW Btk FORMULATED PRODUCTS III.

CONCLUSIONS: The additive surfactants Molasses, Nu-Film 17 and Reddy-It did not improve the effectiveness of the new test Btk biological for the control of cabbage foliar insects. The commercial standard DIPEL 2XDF with Agral 90 provided higher insect control than that of the new Btk insect control product. The most effective cabbage foliar insect control product was the inorganic insecticide DECIS 5.0 EC.

FIELD EVALUATION OF INSECTICIDES FOR THE CONTROL OF SWEDE MIDGE IN CABBAGE AND OTHER FOLIAR INSECTS - 2003.

CONCLUSIONS: The use of ASSAIL 70WP for the control of swede midge unfortunately does not provide adequate control of other foliar feeding cole crop insects. The most effective products tested for the Imported cabbageworm and the Diamondback moth were WARRIOR 122EC, MATADOR 120EC and DECIS 5EC. TRACER 480SC was the next most effective trailing off at the late assessment date. The higher rate of ASSAIL 70WP was more effective than the lower rate which was equal in control of these insects similar to ADMIRE 240F.

EVALUATION OF THE INSECTICIDE "INSECT STOP" FOR THE CONTROL OF INSECTS IN CABBAGE I - 2003.

CONCLUSIONS: The insecticide INSECT STOP was ineffective in the control of the Imported cabbageworm and the Diamondback moth in cabbage. In a subsequent test where the INSECT STOP material was sprayed directly onto the cabbageworm larva, control was excellent. INSECT STOP must be applied either directly onto the insect target or be incorporated into a formulation to extend its effective life on the foliage.

EVALUATION OF THE INSECTICIDE "INSECT STOP" FOR THE CONTROL OF INSECTS IN CABBAGE II.

CONCLUSIONS: Neither INSECT STOP nor the laboratory prepared *Bacillus thuringiensis* *va. kurstaki*, Btk provided any level of insect control in cabbage. The additional water used labeled as a drench treatment did not improve the control of cabbage insects.

LABORATORY EVALUATION OF THE INSECTICIDE "INSECT STOP" APPLIED DIRECTLY ONTO LARVAE OF THE IMPORTED CABBAGEWORM.

CONCLUSIONS: The insect control product INSECT STOP provided excellent control of the Imported cabbageworm when the material was applied directly onto the insect larvae. The control action was quick similar to the synthetic pyrethroid DECIS 5.0EC and much faster than either of the commercial or experimental-London strain of *Bacillus thuringiensis* *var. kurstaki*.

THE USE OF PROSPER AS A SEED TREATMENT FOR THE CONTROL OF CABBAGE MAGGOTS AND FLEA BEETLES IN PROCESSING CABBAGE.

CONCLUSIONS: The seed treatments containing G7009-01 - PROSPER - clothianidin significantly speed up the germination of cabbage seed. Seeds treated with SUCCESS 280SC (spinosad) were delayed for 2 days as the material had not arrived at time of seeding. Emergence counts were not taken on May 13 however the plant emergence caught up indicating no delay in emergence due to the chemical SUCCESS 480SC treatment. There were no differences in germination between L1012-A1 - GAUCHO - imidacloprid and the untreated control. None of the materials effectively controlled a high population of flea beetles. There were not enough cabbage maggots to evaluate treatment effects.

PEPPERS

TO COMPARE THE DISEASE EFFICACY AND CROP TOLERANCE OF COPPER HYDROXIDE WITH THE CURRENTLY REGISTERED WETTABLE POWDER FORMULATIONS IN FIELD PEPPERS - Garden Plot.

CONCLUSIONS: The most effective copper hydroxide formulations to control bacterial spot in peppers was the highest rate of the 24.4 FL formulation followed by the 50WP copper hydroxide formulation. Both of these treatments were more effective than the standard KOCIDE 2000 formulation. Improved bacterial spot control was obtained when MANZATE 200DF was tank mixed with KOCIDE 2000.

TO COMPARE THE DISEASE EFFICACY AND CROP TOLERANCE OF COPPER HYDROXIDE WITH THE CURRENTLY REGISTERED WETTABLE POWDER FORMULATIONS IN FIELD PEPPERS - Field Range Plot.

CONCLUSIONS: The most effective copper hydroxide formulations to control bacterial spot in peppers was the highest rate of the 24.4 FL formulation followed by the 50WP copper hydroxide formulation. Both of these treatments were more effective than the standard KOCIDE 2000 formulation. Improved bacterial spot control was obtained when MANZATE 200DF was tank mixed with KOCIDE 2000.

INFECTIVITY OF MYCORRHIZAL FUNGI IN PEPPERS.

CONCLUSIONS: The addition of mycorrhizal fungi to the roots of pepper transplants did not result in any significant improvement in either plant vigour ratings throughout the season nor did it show any improvements in total fruit numbers or yield of peppers.

POTATOES

EVALUATION OF V-10112 AS A FOLIAR AND IN-FURROW APPLICATION FOR THE CONTROL OF FOLIAR INSECTS IN POTATOES.

CONCLUSIONS: A moderate to light infestation of Colorado potato beetle populations were controlled using V10112 20% SG and Admire 240Fl applied either in-furrow or as a foliar spray application. V10112 20% SG when applied in-furrow provided excellent control of potato leafhoppers significantly higher control than Admire 240Fl in-furrow. In-furrow applications especially when using V10112 20% SG at all three rates tested were considerably more effective than when used as a foliar spray.

EFFECTIVENESS OF ASSAIL 70WP FOR THE CONTROL OF FOLIAR INSECTS IN POTATOES.

CONCLUSIONS: ASSAIL 70WP at the two rates tested provided excellent control of Colorado potato beetles equal to the standard ADMIRE 240FL. Leafhoppers were more difficult to control using either ASSAIL 70WP or ADMIRE 240FL at their low recommended label rate. Much improved leafhopper control was however achieved when ASSAIL 70WP was used at the higher rate of 80g product/ha.

EVALUATION OF THE INSECTICIDE "INSECT STOP" FOR THE CONTROL OF FOLIAR INSECTS IN POTATOES.

CONCLUSIONS: The insecticide INSECT STOP was ineffective in the control of both Colorado potato beetles and leafhoppers. In a subsequent test where the INSECT STOP material was sprayed directly onto insect larva, control was excellent. INSECT STOP must be applied either directly onto the insect target or be incorporated into a formulation to extend its effective life on potato foliage.

EVALUATION OF POTATO BREEDING LINES FOR THE CONTROL OF LEAFHOPPERS AND COLORADO POTATO BEETLES IN POTATOES.

CONCLUSIONS: The seed viability of these wild tuber-bearing Solanum species was poor.

Extremely high levels of insect resistance was found in some of the breeding lines. TAR, PNT, CRE/CAP, OKA, TRF, MRN AND PLD were all highly resistant to Colorado potato beetle insect foliar feeding, while MED, STO, MGA, ETB AND IFD were highly susceptible to the feeding damage caused by the CPB.

Following closely to the resistance levels for the CPB were the reactions to the potato flea beetle. TAR, PNT, CRE/CAP were highly resistant along with OPL, PLD. The most susceptible potato breeding lines to the potato flea beetle attacks were OKA, STO and MED.

Leafhopper damage was kept low under high insect numbers due apparently to the resistant nature of many of the tested potato breeding lines. The most resistant potato breeding lines to the invasion of leafhoppers were IFD, STO, OPL, PLD, PNT, CHM, OKA while the most susceptible were ETB, MRN, TAR and CRE/CAP.

FUNGICIDE EVALUATION FOR THE CONTROL OF POTATO FOLIAR DISEASES.

CONCLUSIONS: CUPROFIX DISPERSS 20DF and both formulations of PENNCOZEB, 75DF and 4F, provided equal and effective control of early blight in potatoes compared with the commercial standard fungicide BRAVO 500.

SWEET CORN

THE USE OF PONCHO AS A SEED TREATMENT FOR THE CONTROL OF SEEDLING INSECTS AND DISEASES IN PROCESSING SWEET CORN.

CONCLUSIONS: The seed treatment PONCHO, containing the active ingredient insecticide clothianidin, effectively reduced the number of insect thrips found on processing sweet corn. The highest number of emerged sweet corn seedlings were in the PONCHO seed treatment plots compared to the untreated sweet corn seeds.

EVALUATION OF THE INSECTICIDE "INSECT STOP" FOR THE CONTROL OF EUROPEAN CORN BORER IN SWEET CORN.

CONCLUSIONS: INSECT STOP was not effective in controlling European corn borer in sweet corn. The commercial standard WARRIOR 122 SC did provide excellent control of this insect.

EFFECTIVENESS OF AERIAL APPLICATIONS OF WARRIOR 122 SC AND MATADOR 120 EC FOR THE CONTROL OF EUROPEAN CORN BORER IN SWEET CORN

CONCLUSIONS: WARRIOR 122SC provided a higher level of European corn borer control in sweet corn when applied by air than did MATADOR 120EC and the commercial standard FURADAN 480F. The medium and higher chemical rates of WARRIOR 122SC were needed under the moderate level of insect pressure, especially late in the season.

SEED CORN

CONTROL OF CORN LEAF RUST AND EUROPEAN CORN BORER IN INBRED SEED CORN.

CONCLUSIONS: The fungicide QUADRIS 250EC effectively controlled a severe level of corn leaf rust. The level of control was not adversely affected when applied in combination with either insecticide, MATADOR 120EC or WARRIOR 122EC. QUADRIS 250EC was slightly more effective than the commercial standard fungicide TILT 250EC. European corn borer pressures were slight however the insecticides MATADOR 120EC, WARRIOR 122EC, SUCCESS 480SC and RIPCORD 400EC were effective in significantly reducing the number of ears infested by ECB. None of the insecticides proved efficacious against the rust disease organism nor did any of the fungicides reduce the damage caused by the ECB.

CONTROL OF CORN LEAF RUST IN INBRED SEED CORN.

CONCLUSIONS: Excellent control of common leaf rust of seed corn was achieved with HEADLINE 250EC, TILT 250EC and QUADRIS 250EC. The rate of QUADRIS 250EC provided consistently high levels of rust control with TILT 250EC being slightly less effective. All four rates of HEADLINE 250EC effectively controlled leaf rust with the lower rate showing a slight decrease in control. There was no significant difference amongst the higher three rates of HEADLINE 250EC. All fungicides improved seed corn yields.

SQUASH

POWDERY MILDEW CONTROL IN SQUASH.

CONCLUSIONS: Outstanding powdery mildew control was achieved using BAS 51604F 38%WG. Control was greater than the commercial standard BRAVO 500. Although not statistically significant, the weights of mature and immature squash suggested a delay in crop maturity which is often observed using the more effective fungicides extending plant life. In this years trial the extended greening of the crop did not translate into higher total squash yields when compared to the untreated control.