

ONTARIO PROCESSING VEGETABLE GROWERS RESEARCH SUMMARY RESULTS - 2005

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

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BROCCOLI

BASF PRODUCTS FOR THE CONTROL OF FOLIAR INSECTS IN BROCCOLI - 2005

CONCLUSIONS: BAS 32000I 240 SC was not as effective in controlling the foliage insects attacking broccoli at this location as the commercial standard SUCCESS 480 SC however BAS 32000I was slightly more effective, especially at the highest rate tested than the insecticide ADMIRE 240 SC. Multiple sprays of SUCCESS 480 SC effectively controlled all of the insect pests that attacked broccoli.

CABBAGE

SWEDE MIDGE CONTROL IN GREENHOUSE TRANSPLANTS

CONCLUSIONS: In cabbage, foliar drench treatments of Intercept at the 0.75X and 1X rates were effective in preventing swede midge damage to seedlings. Although some damage was still observed, in the Trial 2 Cabbage, almost all of the damage was restricted to minor twisting of the stem and/or leaves. Severe damage and death of meristem (blind plants) was very rare in these treatments, but was much more prevalent in the control and other treatments (including Tristar, the currently recommended product).

The absence of swede midge larvae on any Cabbage 2 plants treated with Intercept at the 0.75X and 1X rates is very positive and indicates that Intercept, at one of these two rates, is effective against swede midge. Due to the limitations of this study, it is not possible to state whether the lack of larvae on these plants is due to deterrence of egg-laying, contact toxicity of Intercept to eggs and neonate larvae, or toxicity to young larvae when they commence feeding.

Although field experience demonstrates that broccoli crops are more susceptible to damage than cabbage crops, in this seedling study damage levels were considerably higher on cabbage than broccoli. Data are thus not conclusive on the efficacy of Intercept in protecting broccoli seedlings from swede midge infestation. It is likely that Intercept would be as effective on broccoli as cabbage, but very low infestation levels on broccoli prevented accurate assessment of efficacy.

The presence of higher damage levels in Broccoli 1 and Cabbage 2 plants with Tristar, the

product currently recommended to growers for protection of seedlings against swede midge is alarming, and underscores the need for the registration of an alternate product, such as Intercept, that has greater efficacy.

EVALUATION OF PHYTOREMEDIATION ORGANISMS ON SEEDLING CABBAGE AND THE RESPONSE IN THE FIELD - 2005

CONCLUSIONS: Cabbage emerged faster from seed that was not coated with a fungicide than from the fungicide treated seed or raw seed. The two soil remediation organism combination UW 3&4 effectively speed up the slow emerging fungicide coated seeds but was not able to influence the emergence of the more rapid emerging raw seeds. This early growth difference remained for the next 4 weeks while the plants were growing in the greenhouse, that is the UW 3&4 treated seeds which provided the extra boost in emergence remained taller in the slowly emerging fungicide coated cabbage seed. The combination using both UW 3&4 significantly increased the dry weight of top plant growth in the raw cabbage seed more than when only one of the organisms, UW3, was used. On the other hand the combination of the UW 3&4 organism mixture significantly increased the fresh root weights in the fungicide coated cabbage seeds. Thus the emergence of the slower emerging coated cabbage seed was significantly improved resulting in greater plant growth as well as improving the fresh root weights when compared to the untreated coated control. The emergence of the fast emerging raw cabbage seed could not be improved using the bioremediation organisms UW 3&4 however the organisms did significantly improve the top dry weights of seedling cabbage grown in the seedling greenhouse.

Once in the field the single use of UW 3 on raw seed was less vigorous than when the seed was treated with either both of the organisms UW3&4 or not at all as in the control. The plant vigour ratings were not improved with the use of the combination bioremediation organisms and in fact the plants that had been planted into the treated peat moss were rated poorer than the controls. It was felt that this was more on how the plants were handled for this treatment rather than a true treatment effect caused by the organisms. The cabbage head quality was remarkably improved when cabbage transplants were grown from raw seed rather than from coated seeds. There was a significant reduction in both number of split heads and cabbage heads with scald. The bioremediation organisms had no influence on this effect. Yields were not affected when using the bioremediation organisms combination UW 3&4.

The addition of a carrier in the delivery of the two phytoremediation organisms made no appreciable difference in any of the assessments when compared to the direct application of these organisms to cabbage seed.

The inclusion of the bioremediation organisms UW3&4 had very little benefit in the production of seedling cabbage nor benefits observed in the field.

EFFECTIVENESS OF HEADS UP FOR THE CONTROL OF BLACK ROT IN CABBAGE - 2005

CONCLUSIONS: Treatments with HEADS UP did not improve the growth rate of cabbage plants in the field. HEADS UP did reduce the foliar insect damage caused by cabbageworm when applied as a foliar spray in the field. Although the quantity of Black Rot was not very high under the dry weather conditions during this trial there appears to be a slight improvement in disease control of Black Rot in cabbage when HEADS UP was applied as a tray dip, as a transplant water treatment and as a foliar spray.

EVALUATION OF COFORMULATIONS OF IMIDICLOPRID AND DELTAMETHRIN FOR THE CONTROL OF FOLIAR INSECTS IN CABBAGE - 2005

CONCLUSIONS: NTN33893 + deltamethrin and DECIS 5.0EC effectively controlled the foliar insect pressure attacking cabbage. AE F106464 and ADMIRE 240F were both ineffective essentially no better than the untreated control.

BASF PRODUCTS FOR THE CONTROL OF FOLIAR INSECTS IN CABBAGE - 2005

CONCLUSIONS: BAS 32000I 240 SC was not as effective in controlling the foliage insects attacking cabbage at this location as the commercial standard SUCCESS 480 SC however BAS 32000I was just as effective as the insecticide ADMIRE 240 SC. Multiple sprays of SUCCESS 480 SC effectively controlled all of the insect pests that attacked cabbage at a level that maintained cabbage yield.

CONTROL OF CABBAGE FOLIAR INSECTS USING Btk AND AMINO FEED UV PRODUCTS I - 2005

CONCLUSIONS: The newly formulated Btk material from Dr. A. Margaritis, Professor of Biochemical Engineering, Department of Chemical and Biochemical Engineering, University of Western Ontario, London, Ontario, N6A 5B9 has been shown to be slightly less effective or often just as effective in controlling foliar insects attacking cabbage over the years across many different product testing trials. It was felt that it needed an additive to protect the material to improve its effectiveness. The sun screen or UV blocker Amino Feed UV was ineffective in improving the Btk product providing no better levels of insect control than when using Btk alone. In this trial the commercial DIPEL 2XDF product was slightly more effective than either the Btk or Bt-I with or without the UV blocker. The most effective product in controlling cabbage foliar insects was the commercial standard DECIS 5.0 EC

EVALUATION OF HEADS UP FOR THE CONTROL OF BLACK ROT ON PLUG CABBAGE IN THE GREENHOUSE- 2005

CONCLUSIONS: There was not sufficient Black Rot disease pressure to evaluate the effect of different application timings of HEADS UP for the control of the bacterial disease Black rot in cabbage.

CARROTS

RHIZOCTONIA CROWN ROT CONTROL IN PROCESSING CARROTS- 2005

CONCLUSIONS: Neither QUADRIS 250EC nor CABRIO 20EG applied at planting or two weeks after planting adversely effected the emergence or plant vigour of processing carrots. When clumping the application timings together for analysis, there appears to be a benefit in applying QUADRIS 250EC early at planting while CABRIO 20EG was as effective when applied early as well as later. The timing of a single application early in the growing season did not provide sufficient residual activity to control a heavy infection of Cercospora Leaf Spot disease later in the growing season.

LIMA BEANS

EVALUATION OF CROP TOLERANCE OF QUILT 200SC AND TILT 250EC ALONE AND TANK MIXED WITH MATADOR 120EC APPLIED TO LIMA BEANS - 2005 - Location 1

CONCLUSIONS: There were no visual foliar phytotoxicity symptoms however the higher rates of both QUILT 200 SC and TILT 250 EC appeared to burn off the youngest set of flowers which in this trial were late flowers which did not form pods prior to harvest. The treatments did not cause any reduction in lima bean yields.

PEAS

EVALUATION OF CROP TOLERANCE OF QUILT 200SC AND TILT 250EC ALONE AND TANK MIXED WITH MATADOR 120EC APPLIED TO PEAS - 2005 - Location 1

CONCLUSIONS: There were no visual foliar phytotoxicity symptoms however the yields at the higher rates of QUILT 200SC and TILT 250EC were significantly lowered. There were no treatment effects on the tenderometer readings at time of harvest.

EVALUATION OF CROP TOLERANCE OF QUILT 200SC AND TILT 250EC ALONE AND TANK MIXED WITH MATADOR 120EC APPLIED TO PEAS - 2005 - Location 2

CONCLUSIONS: There were no visual foliar phytotoxicity symptoms nor did any of the spray applications cause any damage to pea yields or quality.

PEPPERS

ORGANIC PLANT WASH FOR THE CONTROL OF BACTERIAL SPOT IN PEPPERS - 2005

CONCLUSIONS: Multiple applications of the organic plant wash significantly reduced the number of bacterial spot disease lesions on the foliage of peppers. The reduction of lesions when compared to the untreated control plot were not that great compared to the numerical reduction of bacterial spot lesions with the commercial standard KOCIDE 2000.

EVALUATION OF CROP TOLERANCE OF QUILT 200SC AND TILT 250EC ALONE AND TANK MIXED WITH MATADOR 120EC APPLIED TO PEAS -2005 - Location 2

CONCLUSIONS: There were no visual foliar phytotoxicity symptoms nor did any of the spray applications cause any damage to pea yields or quality.

EFFECTIVENESS OF THE FUNGICIDE TANOS 50 DF IN SUPPRESSING BACTERIAL SPOT IN FIELD PEPPERS - 2005

CONCLUSIONS: TANOS 50DF when applied alone or in combinations with the low rate of KOCIDE 2000 were ineffective in controlling bacterial spot in peppers. The lower rate of KOCIDE 2000 of 750 g product/ha was also ineffective and required the higher rate of 2500 g product/ha to significantly reduce the number of bacterial spot lesions on the foliage of peppers.

THE EFFECT OF AGRI-FOS FOR THE REDUCTION OF TRANSPLANT STRESS AND CONTROL OF BACTERIAL SPOT IN PEPPERS - 2005

CONCLUSIONS: AGRI FOS 400F when applied alone or in combination with MANZATE 200DF did not control bacterial spot in peppers nor did it result in any boost in pepper yields.

EVALUATION OF TIMING OF TREATMENTS OF HEADS UP FOR THE CONTROL OF BACTERIAL SPOT IN FIELD PEPPERS - 2005

CONCLUSIONS: The foliar applications of HEADS UP applied either singly in the greenhouse or one week after transplanting reduced the number of bacterial spot lesions on the foliage of peppers. The level of bacterial spot infections were fairly low in this trial. None of the application timings of HEADS UP increased plant vigour to the point of increasing pepper yields.

EVALUATION OF PHYTOREMEDIATION ORGANISMS ON SEEDLING PEPPERS AND THE RESPONSE IN THE FIELD - 2005

CONCLUSIONS: The carrier used to incorporate the phytoremediation organisms in the seed treatments had a negative effect reducing the rate of seedling emergence in the greenhouse. This slow emergence resulted in a lower plant vigour rating early in the growth cycle on May 2 however by June 1 the plants had recovered resulting in no significant difference in plant vigour ratings one week prior to transplanting in the field. There was no significant differences in plant growth in the greenhouse as reflected in similar foliage and root wet and dry weights. In the field the only difference was caused by the technique of using peat moss which reduced the field establishment of peppers resulting in a loss in yield.

The bioremediation organisms UW 3&4 had no effect on pepper growth in the greenhouse nor in the field.

EVALUATION OF HEADS UP FOR THE CONTROL OF BACTERIAL SPOT ON PLUG PEPPERS IN THE GREENHOUSE- 2005 - 1

CONCLUSIONS: The application of HEADS UP applied as a seed treatment, a seed drench or as a foliar spray and using multiple combinations of each did not effectively control bacterial spot in seedling peppers. The only effective treatment was the standard KOCIDE 2000 applied three times as a foliar spray. The KOCIDE 2000 treatment appeared to improve the growth of the seedling pepper transplants.

EVALUATION OF PHYTOREMEDIATION ORGANISMS FOR THE CONTROL OF BACTERIAL SPOT ON SEEDLING PEPPERS- 2005

CONCLUSIONS: The bioremediation organisms, UW 3&4 were not able to alter the disease defence mechanism in peppers sufficient to control the bacterial spot organism causing leaf lesions on pepper seedling transplants.

SNAP BEANS

EVALUATION OF POWDERY MILDEW EFFICACY OF QUADRIS 250EC, QUILT 200SC AND TILT 250EC TANK MIXED WITH MATADOR 120EC APPLIED TO SNAP BEANS - 2005 - Location 1

CONCLUSIONS: There was no powdery mildew observed in this trial due to weather conditions not favouring the incidence of this disease. The green snap bean cultivar, Doran, showed a phytotoxicity symptom, a yellow or bleaching effect of the foliage however the symptoms were not related to the treatments. The symptom was caused by sun scalding during a very hot and dry summer with high sunlight periods. These same sun scalding symptoms were not observed on the yellow snap bean cultivars. It was concluded that the fungicides, TILT, QUADRIS and QUILT applied alone or when tank mixed in with the

insecticide MATADOR do not cause any adverse foliage symptoms nor have any effect on snap bean yields when devoid of any pest pressures, either fungal nor insects.

EVALUATION OF CROP TOLERANCE OF QUADRIS 250EC, QUILT 200SC AND TILT 250EC TANK MIXED WITH MATADOR 120EC APPLIED TO SNAP BEANS - 2005 - Location 2

CONCLUSIONS: There was noted a slight phytotoxicity symptom, a yellow or bleaching effect of the foliage however the symptoms were not related to the treatments. The symptom was caused by sun scalding during a very hot and dry summer with high sunlight periods. It was concluded that the fungicides, TILT, QUADRIS and QUILT applied alone or when tank mixed in with the insecticide MATADOR do not cause any adverse foliage symptoms nor have any effect on snap bean yields when devoid of any pest pressures, either fungal nor insects. There was no powdery mildew observed in this trial due to weather conditions not favouring the incidence of this disease.

EVALUATION OF CROP TOLERANCE OF QUADRIS 250EC, QUILT 200SC AND TILT 250EC TANK MIXED WITH MATADOR 120EC APPLIED TO SNAP BEANS - 2005 - Location 3

CONCLUSIONS: This mid-season seeded trial apparently was subjected to considerable foliage injury especially on the green snap bean cultivar, Doran however as in the other two trials the phytotoxicity was not related to any treatment effect. The symptom was caused by sun scalding during a very hot and dry summer with high sunlight periods. The timing of the injury appears to be related to a weather pattern affecting the very young emerging leaves. It was concluded that the fungicides, TILT, QUADRIS and QUILT applied alone or when tank mixed in with the insecticide MATADOR do not cause any adverse foliage symptoms nor have any effect on snap bean yields when devoid of any pest pressures, either fungal nor insects. There was no powdery mildew observed in this trial due to weather conditions not favouring the incidence of this disease.

EVALUATION OF CROP TOLERANCE OF QUADRIS 250EC, QUILT 200SC AND TILT 250EC TANK MIXED WITH MATADOR 120EC APPLIED TO SNAP BEANS - 2005 - Location 4

CONCLUSIONS: This later seeded trial apparently was not subjected to the sun scalding effected noted at the other two locations where the snap beans were planted on June 11, 18 days earlier. There was no phytotoxic effect either caused by sun scalding nor treatment effects. It was concluded that the fungicides, TILT, QUADRIS and QUILT applied alone or when tank mixed in with the insecticide MATADOR do not cause any adverse foliage symptoms nor have any effect on snap bean yields when devoid of any pest pressures, either fungal nor insects. There was no powdery mildew observed in this trial due to weather conditions not favouring the incidence of this disease. There was however considerable bean beetle damage to the foliage. The timing of the insecticide MATADOR was not particularly timed for an insect outbreak and in any event was applied too late for insect control at this site.

SQUASH

POWDERY MILDEW CONTROL IN SQUASH USING MICROTHIOL DISPERS - 2005

CONCLUSIONS: MICROTHIOL DISPERS at both the 5.0 and 2.5 kg product per ha rates effectively controlled a severe infection of powdery mildew in squash. The control was equal to BRAVO 500F which also effectively controlled powdery mildew in squash.

POWDERY MILDEW CONTROL IN SQUASH USING PREV AM - 2005

CONCLUSIONS: The product PREV AM was ineffective in controlling powdery mildew in squash. BRAVO

500 however was effective when applied alone while when alternated with PREV AM that combination treatment provided only moderate control of powdery mildew in squash.

SWEET CORN

EVALUATION OF MATADOR 120EC AND QUADRIS 250EC FOR THE CONTROL OF EUROPEAN CORN BORER AND RUST IN SWEET CORN - Location 1 - 2005

CONCLUSIONS: The fungicide QUADRIS 250EC effectively controlled leaf rust in sweet corn. Rust lesions began to become noticeable on August 13 but had increased in severity by the second disease rating on August 18. The level of rust control was not adversely affected when the insecticide MATADOR 120EC was tank mixed in with QUADRIS 250 EC. The insecticide MATADOR120EC had no fungicidal properties and did not reduce the leaf rust levels. The timing of these products was not appropriate to control a heavy infestation of European corn borers.

EVALUATION OF MATADOR 120EC AND QUADRIS 250EC FOR THE CONTROL OF EUROPEAN CORN BORER AND RUST IN SWEET CORN - Location 2 (grower location)- 2005

CONCLUSIONS: The insect pressures were relatively low in this grower trial and as a result treatment differences could not be determined. There was no appreciable corn leaf rust at this location.