PEPPERS

A URMULE was submitted for KOCIDE 101 for the control of bacterial speck, spot and canker on tomatoes and bacterial spot on peppers seedling plug transplants grown in Ontario greenhouses. I have submitted the proposal on behalf of the vegetable seedling and processing tomato and pepper industry with support from the manufacturer, Griffin L.L.C., the Ontario Tomato Seedling Growers Marketing Board, the Ontario Processing Vegetable Growers, the Nabisco Ltd processing company and a pepper grower from the Dresden area. I have been in constant contact with the PMRA authorities, Doug Rothwell who indicated to me that he has received the approval from 3 out of the 4 agencies which need to sign off. It looks favourable but until we get the full clearance we are only partially there.

RESISTANCE LEVELS IN PEPPER CULTIVARS TO BACTERIAL SPOT

The range of resistance to bacterial spot in peppers is listed in order from high to low resistance levels found in this years pepper cultivar test. The number of new pepper cultivars having levels of resistance to bacterial spot is improving. PR 99 Y-3, BOYNTON BELL, HMX 9646, EX12292, X3R IRONSIDES and X3R WIZARD were highly resistant to bacterial spot. They were followed by PR 99 R-2, DIEGO, ORION, PR 99 R-11 and PR 93-2-1 which showed moderate levels of spot resistance. KING ARTHUR, X3R RED KNIGHT and PX 304496 appeared to be very susceptible to bacterial spot while EX 12283 was extremely susceptible to bacterial spot.

USE OF SURFACTANTS TO IMPROVE THE EFFECTIVENESS OF COPPER FOR THE CONTROL OF BACTERIAL DISEASES IN PEPPERS

KOCIDE 101 significantly reduced the number of bacterial spot lesions on the foliage of pepper plants. This level of bacterial spot control observed was not high especially considering the number of spray applications that were made, i.e. 10, and several surfactants were evaluated to determine if the level of bacterial control could be elevated. However none of the surfactants tested including NUFLM-17, SIL WETT and AG BALANCE could improve KOCIDE 101s level of bacterial control. This trial again confirmed that BRAVO 500 applied by itself provides no control of bacterial spot.
BACTERIAL SPOT CONTROL IN PEPPERS USING ASSISTOR

Significant bacterial spot disease was observed and recorded in this plot. The level of disease began to rise in July but started to decline in August then increased again in September due to the influence of weather. By the first evaluation on July 17, five applications of ASSISTOR had been applied with GARLIC OIL only being included in the last two applications. ASSISTOR when applied alone did not appear to have any beneficial influence on reducing the level of bacterial spot in peppers. On the second evaluation, on August 5, the GARLIC OIL treatment with ASSISTOR seemed to have reduced the number of bacterial spot clusters on the pepper foliage. By August 25 the weather conditions no longer favoured the incidence of bacterial spot with the foliage growing well with no significant bacterial symptoms. By late September the amount of bacterial disease had increased substantially however the last spray was made on August 16 and any beneficial effect that GARLIC OIL plus ASSISTOR may have made could not be observed.

EUROPEAN CORN BORER CONTROL IN PEPPERS USING CONFIRM 240F AND RH-2485 240SC

DECIS 5EC provided the highest numeric level of European corn borer control with equivalent control observed using CONFIRM 240F at either rate and the rate tested for RH-112485 240SC. The addition of COMPANION to CONFIRM 240F did not improve the level of corn borer control than when CONFIRM 240F was used alone.

THE EFFECT OF PACLOBUTRAZOL ON THE GROWTH AND YIELD OF PEPPERS

Paclobutrazol applied in the greenhouse to pepper seedlings at the 2 leaf stage at a rate of 5ppm reduced plant height and significantly increased the fresh and dry weights of pepper roots at time of transplanting. Under conditions of controlled plant growth in the greenhouse by the grower there was no difference in stem diameter or foliage weights. The grower was not prepared to apply additional nutrients to the pepper plants in the greenhouse for fear of encouraging uncontrolled pepper growth which commercially causes difficulty at time of transplanting. Seeing the controlled growth of the Paclobutrazol treated seedlings, he would be prepared to apply additional nutrients in the future with the anticipated increase in foliage wet and dry weights and possibly stem diameter to produce a much sturdier pepper transplant one that could possibly better stand the shock of field establishment. The Paclobutrazol transplants outgrew the delayed growth effect observed in the greenhouse once established in the field however there was a slight hold back in fruit production on June 21 but the plants easily caught up soon thereafter. There were no differences in yield.
EVALUATION OF THE BENEFITS OF SOIL AMENDMENTS IN THE GROWTH AND PRODUCTIVITY OF PROCESSING PEPPERS

The vigour ratings early in the season were not as dramatic as observed with the tomatoes next to them. It was only later in the season that differences in foliage became evident. This in some regard was related to the amount of bacterial spot disease in the non-composted plot area. There was a significant amount of bacterial spot especially in the yellow banana variety but only in the plot area where compost had not been applied. This suggests that the vigour of the plant created by the more favourable growing conditions when spent mushroom compost was applied created conditions that the plant could ward off bacterial infection. The benefits from this fact alone were noted in the total yields of the yellow banana peppers. It was interesting that the bell peppers did not respond to the addition of spent mushroom compost. It was noticed there were considerably fewer weeds in the spent mushroom plot area.

Benefits of Soil Amendments for Peppers

Growth and Yield of Peppers

- The higher the number the better the control of bacterial spot and the more vigorous the pepper plants.
SWEET CORN

EUROPEAN CORN BORER CONTROL IN SWEET CORN USING CONFIRM 240F AND RH-2485 240SC - RIDGETOWN
European corn borer insect pressures were high this year with the unsprayed plots averaging 14.8 infested cobs per 20 or 74% of the sweet corn cobs having insect damaged ears. All of the insecticides tested showed effective control. This included CONFIRM 240F with or without the surfactant COMPANION, the new insecticide RH-112485 240SC and the standard insecticide used in this trial CYMBUSH 250EC.

EVALUATION OF DIPEL 2XDF FOR THE CONTROL OF EUROPEAN CORN BORER IN SWEET CORN - RIDGETOWN
European corn borer insect pressures were high this year with the unsprayed plots averaging 15.5 infested cobs per 20 or 78% of the sweet corn cobs having insect damaged ears. The most effective treatment was the commercial standard insecticide CYMBUSH 250EC. Under the heavy insect pressures noted in this year’s trials the higher commercial rate of DIPEL 2XDF was required but was not as effective as the CYMBUSH 250EC treatment. The addition of either of the two surfactants ASSISTOR nor BOD BALANCE provided any benefit either when used alone or to help raise the level of insect control when using half rates of DIPEL 2XDF.

EUROPEAN CORN BORER CONTROL IN SWEET CORN USING ASSISTOR - RIDGETOWN
CYMBUSH 250EC applied at the recommend commercial rate significantly controlled European Corn Borers in sweet corn. Even the half rate of CYMBUSH 250EC lowered the damage caused by corn borers. ASSISTOR when applied alone did not reduce the number of corn borers at either rate tested. The combination of ASSISTOR with GARLIC OIL did not show any improvements in European corn borer control nor did the addition of ASSISTOR improve the level of insect control when combined with CYMBUSH 250EC.

USE OF SEED TREATMENTS FOR THE CONTROL OF THRIPS, FLEA BEETLES AND STEWART’S WILT - RIDGETOWN
Populations of flea beetles were not noticed until July 17 and in low numbers. Thus the resultant infection of Stewart’s Wilt came late in July with no differences noted between seed treatments. However early in the season there was considerable numbers of thrips which caused noticeable leaf scaring and assessments were taken as there appeared to be an effect amongst the seed treatments tested. Sweet corn cultivar BSS, Tables 1 & 2, had the lowest germination and emergence however there was no treatment effect noticed. GSS 9377, Tables 1 & 4 had the next lowest seed germination ratings with early stand counts indicating a significant trend towards improved stands compared to the untreated check plot using the lowest rate of GAUCHO 600. As the GAUCHO rates increased the early stand counts decreased with a significant loss of stand count between the lowest, 83.3 vs. the highest 833 ml/100 kg rates of seed treatments. This delayed emergence observation disappeared within a 10 days of this observation with no significant differences in total plant stand amongst seed treatments. GH 1861 had the highest seed germination counts Table 1, and a significant improvement in plant stands using the combination seed treatment of APRON XL + MAXIM 4FS and GAUCHO 600. There did not appear to be any difference between the two GAUCHO formulations of 480 and 600. Seed treatments with increasing rates of GAUCHO significantly decreased the numbers of thrips found on sweet corn seedling leaves and consequently reduced the damage caused by thrips. The most effective treatments were the highest rates of the two GAUCHO formulations of 600 and 480 used at rates of 833 and 520 ml product/100 kg of seed respectively.
CONTROL OF LEAF RUST IN SWEET CORN
Control of common rust in sweet corn was achieved with the fungicides FOLICUR EW 250 and TOPAS 250 EC. BRAVO 500 also reduced the degree of rust on the foliage of sweet corn but not nearly to the extent as did FOLICUR and TOPAS. The amount of rust in this trial was significant causing a reduction in yield. Yields were significantly improved using especially the FOLICUR and TOPAS treatments but also with BRAVO 500. The increase in yield was noted in an increase in both numbers and weight of cobs harvested and of a marketable size.

EUROPEAN CORN BORER CONTROL IN SWEET CORN USING CONFIRM 240F AND RH-2485 240SC - STRATHROY
European corn borer insect pressures were high this year with the unsprayed plots averaging 5.8 infested cobs per 20 or 29% of the sweet corn cobs having insect damaged ears. All of the insecticides tested showed effective control. This included CONFIRM 240F with or without the surfactant COMPANION, the new insecticide RH-112485 240SC and the standard insecticide used in this trial, CYMBUSH 250EC.

EVALUATION OF DIPEL 2XDF FOR THE CONTROL OF EUROPEAN CORN BORER IN SWEET CORN - STRATHROY
European corn borer insect pressures were high this year with the unsprayed plots averaging 5.5 infested cobs per 20 or 28% of the sweet corn cobs having insect damaged ears. The most effective treatment was the commercial standard insecticide CYMBUSH 250EC. Under the heavy insect pressures noted in this year’s trials and only two applications made, neither of the rates of DIPEL 2XDF were sufficient to control this insect. Similarly neither of the two surfactants ASSISTOR nor BOD BALANCE provided any benefit either when used alone or to help raise the level of insect control when using half rates of DIPEL 2XDF.

EUROPEAN CORN BORER CONTROL IN SWEET CORN USING ASSISTOR - STRATHROY
CYMBUSH 250EC applied at the recommend commercial rate significantly controlled European Corn Borers in sweet corn. Even the half rate of CYMBUSH 250EC lowered the damage caused by corn borers. ASSISTOR when applied alone did not reduce the number of corn borers at either rate tested. Although not significantly different the addition of GARLIC OIL with ASSISTOR appeared to have reduced the number of corn borers found in this trial.

USE OF SEED TREATMENTS FOR THE CONTROL OF THRIPS, FLEA BEETLES AND STEWART’S WILT - BALLYMOTE
The emergence counts in two of the three sweet corn cultivars was significantly improved using seed treatments with the combination treatment APRON XL + MAXIM 4FS + GAUCHO 600 averaging the greatest improvement. The highest rate of GAUCHO 600 or 480 did not appear to result in any seedling emergence damage.
Thrips damage was significantly controlled with all seed treatments with the lowest rate of GAUCHO 600 having the lowest numerical control rating, i.e. less control observed.
There was a definite increase in plant foliage vigour when using any of the seed treatments with even the number of plant surviving emergence increased with the combination APRON XL + MAXIM 4FS + GAUCHO 600.
The amount of Stewart’s Wilt came late in the season showing no benefits from the seed treatments. If anything the observations were that due to the increased vigour of the sweet corn treated with seed treatments there was a slight increase in the incidence of Stewart’s Wilt.
USE OF SEED TREATMENTS FOR THE CONTROL OF THRIPS, FLEA BEETLES AND STEWART’S WILT - ST. THOMAS
Seedling emergence from two of the three sweet corn cultivars was significantly improved by using seed treatments containing GAUCHO 600 or 480, CAPTAN-APRON FL or a combination of APRON XL + MAXIM 4FS + GAUCHO. In this location south of St. Thomas there were no Thrips, Flea beetles nor Stewart’s Wilt to be recorded.

COLE CROPS
FOLIAR INSECT CONTROL USING ASSISTOR
The organic insecticide ASSISTOR was not very effective in controlling cabbage foliar insects. Even when added to either of the two standard products CYMBUSH 250 EC and DIPEL 2XDF used at half-rates the ASSISTOR did not improve the level of insect control. The addition of GARLIC OIL to ASSISTOR was also ineffective. High levels of cabbage foliar insect control was however achieved with the half rate of CYMBUSH 250 EC (standard recommended rate is 140 ml product/ha), while the low rate of DIPEL 2XDF was not nearly as effective at these lower than recommended rates.

The initial spray application on June 19 was repeated 3 days later on June 22 due to rainfall soon after application. Further investigations on the rainfall occurrences may help explain the ineffectiveness of the water soluble natural insecticide ASSISTOR.

CUCURBITS
EFFECTIVENESS OF SOVRAN 50WG FOR THE CONTROL OF POWDERY MILDEW IN SQUASH - Watford
Powdery mildew was extensive and severe in this commercial field, significantly defoliating the remainder of the field at assessment time on September 20. The only green vine present was observed in our research plots. The trial was sprayed two times with excellent powdery mildew control observed. Foliage of squash sprayed with SOVRAN 50WG remained green and healthy into September at all the rates tested. The 14-day spray program of SOVRAN 50WG was basically sprayed only one time on August 10 and although showed signs of powdery mildew it was an improvement over the non sprayed control and provided equal powdery mildew control than the BRAVO 500 treatment that was sprayed two times. Only the highest rate of SOVRAN 50WG and the nonsprayed control was harvested. Yields were significantly improved when squash was protected from infections of powdery mildew bu spraying two times with the fungicide SOVRAN 50WG.

EFFECTIVENESS OF SOVRAN 50WG FOR THE CONTROL OF POWDERY MILDEW ON CUCURBITS - Ridgetown
Powdery mildew severely affected the foliage beginning in early September, with the first being noticed on September 6. Control of the disease was observed in both squash and pumpkins early in September with the low rate of SOVRAN 50WG showing a little weakness. However by September 20, the two lowest rates of SOVRAN 50WG became infected especially in the squash plots as did BRAVO 500 and when the spray interval was extended from 7 to 14 days with SOVRAN 50WG. SOVRAN 50WG at rates of 0.3, 0.6 kg product/ha, applied on a 7-day spray schedule effectively controlled powdery mildew in squash and pumpkins. Numbers of fruit harvested nor their total weights were affected by any of these treatments. Assessments for the cucumber plots could not be made as they had ripened prior to any visual symptoms of powdery mildew.