

THE ONTARIO VEGETABLE GROWERS' MARKETING BOARD

RESEARCH RESULTS

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PROJECT TITLE: THE DEVELOPMENT OF PEST MANAGEMENT STRATEGIES FOR INSECTS AND PLANT DISEASES IN PROCESSING VEGETABLES - 1999.

OBJECTIVES and RESULTS

A. PEPPERS

1. To report and investigate the registration status of fungicides and copper used for processing peppers both in the field and for plug production in the greenhouse.

I have developed a listing of the current registration status for the fungicides and copper compounds used in the greenhouse and field peppers in Canada. A full report is available in my Insect and Disease Management booklet. I have been in contact with PMRA/Health Canada officers and chemical company representatives to determine the most efficient method of extending selected registrations.

HIGHLIGHTS

There are no copper fungicides registered for use on greenhouse peppers.

KOCIDE 101 is NOT registered for use in vegetable seedling greenhouse applications

If a product is registered on a crop in the greenhouse it can be used on both full term and seedling transplants.

Fungicides registered individually on a crop can be tank mixed. Growers assume all risks and responsibilities for tank mixtures.

If greenhouse use is not mentioned on the label or if the label is unspecified then field use only is implied. A product must have greenhouse indicated on its label to be applied in the greenhouse.

Pesticides applied to US destined crops must have a Canadian registration if applied in Canadian greenhouses or fields.

The industry must rely on URMULE - User Requested Minor Use Label Expansion Registrations, to update labels for effective utilization of several products with currently limited label recommendations.

Due Diligence - growers and processors are responsible.

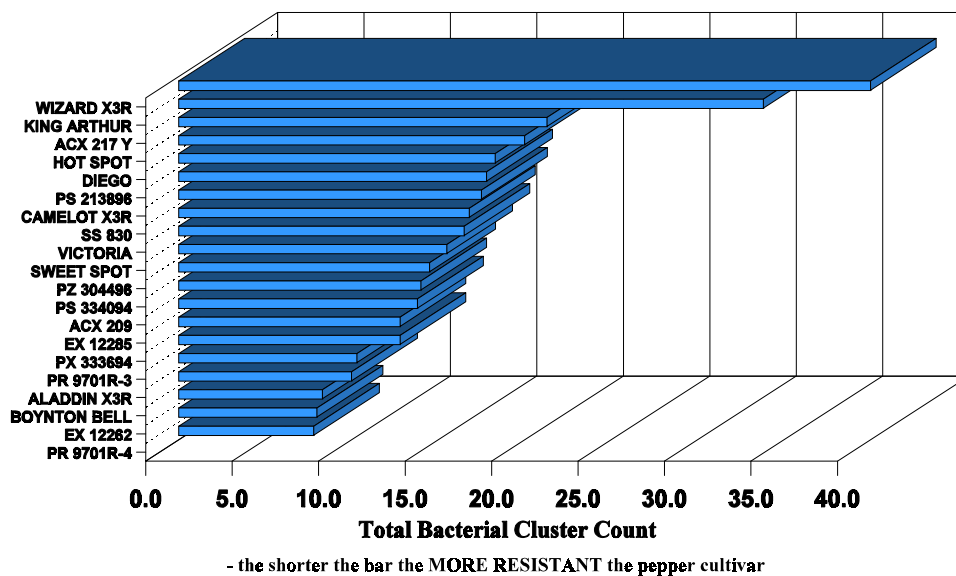
2. To determine the relative resistance levels in commercial pepper varieties grown in Ontario to Bacterial spot.

RESISTANCE LEVELS IN PEPPER CULTIVARS TO BACTERIAL SPOT

The range of resistance to bacterial spot in peppers is identified in the listing and results of this test. The number of new pepper cultivars having levels of resistance to bacterial spot is improving. PR 9701R-4, EX 12262 and BOYNTON BELL were all highly resistance to bacterial spot. They were followed by ALADDIN X3R, PR 9701R-3, PX 333694, EX 12285, ACX 209, PS 334094, and SWEET SPOT, which showed very high levels of resistance. Moderate levels of spot resistance were noted in the following pepper cultivars, VICTORIA, SS 830, CAMELOT X3R, PS 213896, and HOT SPOT. Pepper cultivars which showed less resistance to bacterial spot were ACX 217 Y and especially susceptible were KING ARTHUR and WIZARD X3R.

BACTERIAL SPOT RESISTANCE IN PEPPERS

RIDGETOWN 1999



3. Evaluate spray programs for the control of bacterial spot in processing peppers.

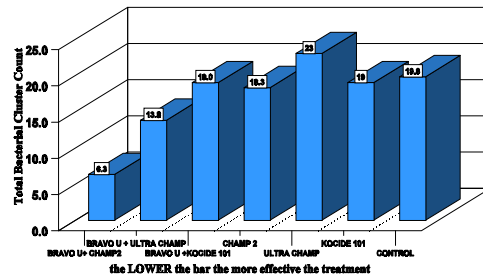
BACTERIAL SPOT CONTROL IN PEPPERS

Although the pepper transplants showed considerable bacterial leaf spots when planted, the incidence of spread and reinfection was slowed due to the dry summer conditions. It was only at the end of the season into October before significant enough bacterial spot symptoms could be observed and measured.

Only the combination of BRAVO ULTREX tank mixed with the copper product CHAMP 2 and to a lesser extent ULTRA CHAMP proved effective in reducing the foliar symptoms caused by bacterial spot in peppers. The combination of BRAVO ULTREX and KOCIDE 101 did not prove successful under these conditions. CGA 245704 50WP was ineffective in modifying the pepper plants, resulting in no reduction in bacterial spot disease incidence. There was no phytotoxicity using CGA 245704 50WP on peppers under these dry weather conditions.

BACTERIAL SPOT CONTROL IN PEPPERS

BACTERIAL DISEASE CLUSTER COUNTS

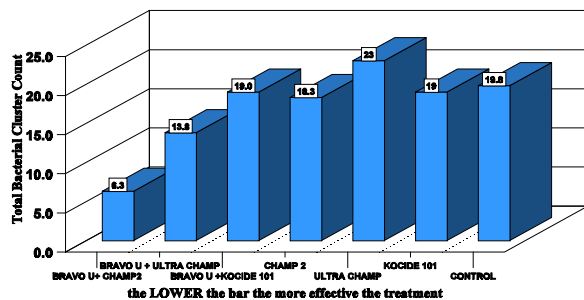


USE OF SURFACTANTS TO IMPROVE THE EFFECTIVENESS OF COPPER FOR THE CONTROL OF BACTERIAL DISEASES IN PEPPERS

Late season bacterial spot was significantly reduced using KOCIDE 101 alone compared to the untreated control. The effects of the addition of various surfactants could not therefore be determined. The addition of SIL WETT in this trial appeared to reduce the control of bacterial spot.

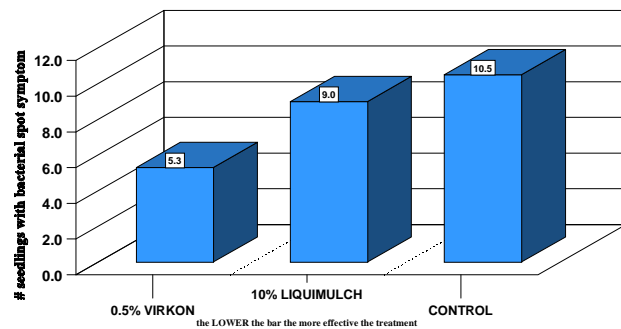
BACTERIAL SPOT CONTROL IN PEPPERS

BACTERIAL DISEASE CLUSTER COUNTS



BACTERIAL SPOT CONTROL IN PEPPERS

SEED TREATMENTS



LIQUIMULCH AS A SEED WASH FOR THE CONTROL OF BACTERIAL SPOT IN PEPPERS

LIQUIMULCH was added to reduce the surface tension in the water bath treatments aiding in the removal or “washing” of the bacteria from the seed. VIRKON is a known bacterial disinfectant. In the first trial the addition of LIQUIMULCH and VIRKON, alone or in combination, significantly increased pepper emergence. The plants contained numerous spot-like bacterial lesions which were counted at the time of assessment. Upon further investigation these lesions were not caused by the bacterial spot organism *Xanthomonas campestris pv. vesicatoria*, but were due to nutrient deficiencies in the soilless mixture. Therefore neither LIQUIMULCH nor VIRKON could be evaluated as control treatments for bacterial spot in the first trial.

In the second trial, a repeat of the first, using a different soilless mixture with more nutrients, there was no difference in seedling emergence. Seedling emergence differences were noted in the first trial using a soilless mixture void of any nutrients. It is possible that the increased noted in emergence was due to the added nutrients provided by the LIQUIMULCH and VIRKON products themselves. There was however a significant difference in the control of the bacterial spot organism observed in the second trial. The addition of LIQUIMULCH reduced the number of pepper plants with lesions caused by the bacterial spot organisms, but only slightly, whereas the addition of the disinfectant VIRKON either alone or in combination with LIQUIMULCH significantly reduced the incidence of bacterial spot in peppers.

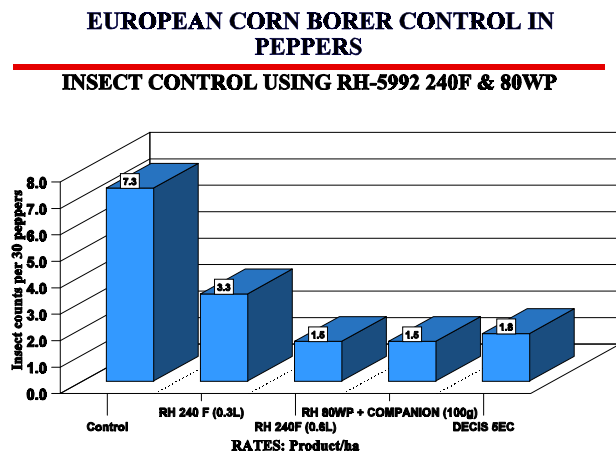
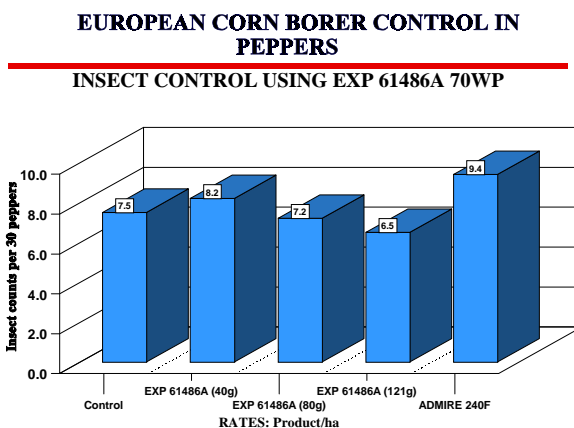
4. Control of European corn borer in peppers.

INSECT CONTROL USING EXP 61486A 70WP FOR THE CONTROL OF EUROPEAN CORN BORERS IN PEPPERS

None of the various rates of EXP 61486A 70WP nor the rate used with ADMIRE 240F controlled the populations of European corn borers in this trial.

EVALUATION OF RH-5992 FORMULATIONS FOR THE CONTROL OF EUROPEAN CORN BORERS IN PEPPERS

Significant European corn borer control was achieved using any one of the chemical treatments examined. Improved corn borer control was achieved using the higher rate, 0.6 L product/ha, of the RH-5992 240F formulation. The addition of the surfactant COMPANION with the lower rate of RH-5992 240F formulations, 0.3 L product/ha, did not improve corn borer control. The 80WP formulation of RH-5992 evaluated at a rate of 100.0 g product/ha with the surfactant COMPANION was amongst the most effective treatments including the higher rate of RH-5992 240F with or without the use of the surfactant COMPANION and also including the standard insecticide treatment DECIS 5EC.



5. Evaluate techniques to enhance earliness in processing peppers.

An article in the September, 1999, Greenhouse Canad issue, outlines the collaborative work being conducted to determine the benefits of Paclobutrazol for earliness in peppers and tomatoes. Vincent Souza-Machado was quoted as saying, “the application of Paclobutrazol (as a foliar spray onto seedling peppers in the greenhouse) makes for a hardier pepper transplant which promotes earlier planting and earlier harvesting. An earlier harvest means the grower’s schedule fits better with the pepper processor’s schedule, and allows for more favourable weather conditions for growers to harvest in”. Details of this study are found in my Insect and Disease Management booklet.

B. SWEET CORN

1. Conduct chemical control and timing trials for the control of European corn borers in processing sweet corn.

DIPEL 2XDF FOR THE CONTROL OF EUROPEAN CORN BORER IN SWEET CORN

European corn borer pressures were very light. Control assessments between treatments could not be determined as significant differences could not be established in the insect damage counts. It was noted that the lowest infestations and flagged tassel numbers were observed with SEVIN XLR PLUS and DIPEL 2XDF with the surfactant NUFILM-17.

DIPEL 2XDF FOR THE CONTROL OF EUROPEAN CORN BORER IN SWEET CORN - SMALL PLOTS WITH STRATHROY FOODS

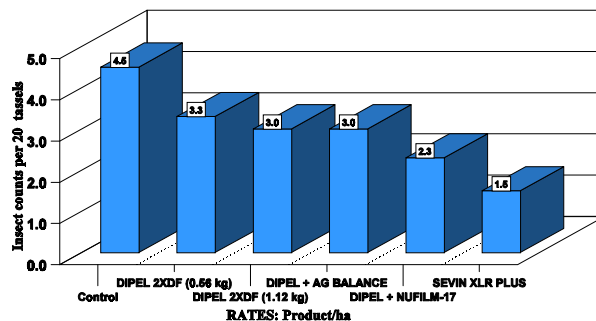
DIPEL 2XDF with or without the surfactant AG BALANCE effectively controlled a low population of European corn borers attacking sweet corn. The standard insecticide SEVIN XLR PLUS was also effective.

DIPEL 2XDF FOR THE CONTROL OF EUROPEAN CORN BORER IN SWEET CORN - LARGE PLOTS WITH STRATHROY FOODS

Control of a light infestation of European corn borers was achieved using the higher rate of DIPEL 2XDF (1.12 kg product per ha). The lower rate of DIPEL 2XDF, at 0.56 kg product/ha, was ineffective, no different than the untreated control. The addition of the natural surfactant AG BALANCE was able to improve the effectiveness of the lower rate of DIPEL 2XDF providing equal corn borer control to that of the higher rate of DIPEL 2XDF. DIPEL 2XDF provided equal control of European corn borers in sweet corn to that of the commercial standard FURADAN 480F.

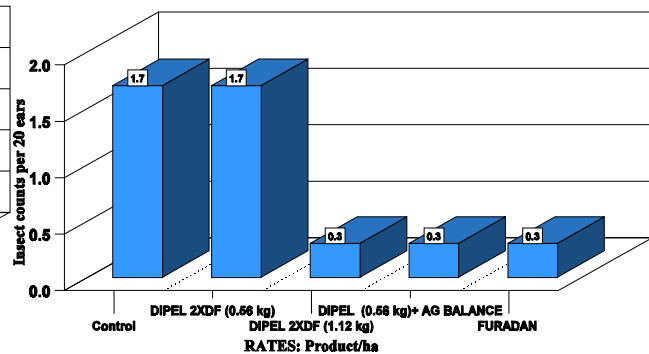
EUROPEAN CORN BORER CONTROL IN SWEET CORN

DIPEL 2XDF WITH AND WITHOUT SURFACTANTS



EUROPEAN CORN BORER CONTROL IN SWEET CORN

DIPEL 2XDF AND THE SURFACTANT AG BALANCE



C. COLE CROPS

1. To report and investigate the registration status of fungicides and copper used for processing cole crops both in the field and for plug production in the greenhouse.

I have developed a listing of the current registration status for the fungicides and copper compounds used on cole crops in the greenhouse and in the field across Canada. A full report is available in my Insect and Disease Management booklet. I have been in contact with PMRA/Health Canada officers and chemical company representatives to determine the most efficient method of extending selected registrations. Highlight comments are provided under PEPPERS.

2. To conduct chemical control and timing trials for the control of cole crop insect pests.

CONTROL OF CABBAGE FOLIAR INSECT PESTS USING RH-5992

The insecticide RH-5992 240F with or without any additional surfactant materials significantly controlled foliar insect pests attacking cabbage. The pressure from imported cabbageworm was higher than diamondback moth in a proportion of 80:20 respectively. The standard CYMBUSH 250EC proved more effective in controlling cabbage insects than RH-5992 240F. The addition of the surfactant COMPANION to RH-5992 240F improved insect control early in the growing season only at the lower rate tested of RH-5992 240F. Increasing the rate of RH-5992 240F improved the level of insect control early however did not appear to significantly improve the level of insect control in cabbage once a measure of control had been established mid to later in the growing season.

CABBAGE FOLIAR INSECTS USING RH-5992 240F

Foliar damage ratings (0-10); 10=Excellent control

