# ONTARIO TOMATO RESEARCH INSTITUTE
# RESEARCH SUMMARY RESULTS - 2002

## THE DEVELOPMENT OF PEST MANAGEMENT STRATEGIES FOR INSECTS AND PLANT DISEASES IN PROCESSING TOMATOES

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### FUNGAL DISEASES

**FOLIAR AND FRUIT DISEASE CONTROL USING BAS FUNGICIDES IN FIELD TOMATOES.** The most effective single treatments were CABRIO EG 20%WG at the 0.8 kg product/ha rate applied at the extended 14-day spray interval, then BAS 51002F 70% at the 0.229 kg product/ha rate, and BAS 510UGF 70% WP at the 0.16 kg product/ha rate both applied on 7 day spray intervals. Reducing the rates of BAS 51002F 70%WP or extending the time between spray applications resulted in less tomato disease control. With CABRIO EG 20%WG and BAS 51002F 70% showing outstanding control when applied alone their combinations provided the highest numerical level of tomato disease control whether used on a 7 or 14-day spray interval. BRAVO 500 SC did not perform well however when tank mixed with CABRIO EG 20%WG or BAS 51002F 70% high levels of disease control were observed presumably due to the highly effective fungicides CABRIO EG 20%WG or BAS 51002F 70% included in the combination treatment. Due to the dry summer tomato fruit size was very small and not representative of a normal crop thus yields were not taken.

**EVALUATION OF ORGANIC PRODUCTS FOR DISEASE CONTROL IN FIELD TOMATOES.** Under the weather conditions and the moderate disease pressure experienced this season, tomato foliar diseases were controlled to the same level with ARMICARB and BAKING SODA both containing sodium carbonate as the commercial fungicide BRAVO 500. The use of COMPOST TEA significantly reduced the level of foliar fungal diseases but to a lesser extent than BRAVO 500 and the sodium bicarbonate formulations. The bacterial populations contained in LACTOSE-BACILLUS were ineffective as were the POWDERED MILK and SKIM MILK applications. In fact tomato foliage sprayed with POWDERED MILK and SKIM MILK showed obvious signs of a sooty mold significantly blackening the tomato foliage in these plots.

### BACTERIAL DISEASES

**CONTROL OF BACTERIAL AND FUNGAL DISEASES USING ALEXIN IN FIELD TOMATOES.** ALEXIN provided a measure of tomato foliar fungal disease control when used alone. When mixed with the fungicide BRAVO 500F there was no additional increase in disease reduction noted under a disease condition that would be described as only moderate coming late into the growing season. Bacterial disease populations were not high enough for treatment comparisons.

**EFFECT OF COPPER HYDROXIDE FORMULATIONS FOR THE CONTROL OF BACTERIAL AND FUNGAL DISEASES OF FIELD TOMATOES - Location 1** . The two formulations of Copper Hydroxide, 361 FL and 37.5DP effectively reduced a high infection rate of bacterial diseases in field tomatoes under an irrigated field plot regime. KOCIDE DF and the higher rate of Copper Hydroxide 361Fl had the fewest clusters of bacterial diseases on August 1, although all treatments had significantly fewer lesions than the unsprayed control plot. Considerable variation in disease counts were recorded by the middle to the end of August just prior to harvest as plants senesced. All treatments reduced the number of anthracnose infected fruit with no adverse effects on total tomato yields.

**EFFECT OF COPPER HYDROXIDE FORMULATIONS FOR THE CONTROL OF BACTERIAL AND FUNGAL DISEASES OF FIELD TOMATOES - Location 2.** The 361 FL formulation was more effective than the 37.5 DP formulation of Copper Hydroxide in controlling mainly the foliar fungal diseases of field tomatoes. The top three fungicides showing effective disease controls were KOCIDE DF, BRAVO 500 and Copper Hydroxide 361 FL at the higher rate tested followed by CHAMPION 50WP. The addition of PENNCOZEB 75 DF did not provide any greater disease control in combination with either CHAMPION 50WP, Copper Hydroxide 361 FL or Copper Hydroxide 37.5 DP.

## AMMONIUM LIGNOSULPHONATE - BACTERIAL

**TO ASSESS THE EFFICACY OF FOLIAR APPLICATIONS OF AMMONIUM LIGNOSULPHONATE FORMULATIONS FOR THE CONTROL OF BACTERIAL SPOT AND SPECK IN FIELD TOMATOES AND PEPPERS - 2002.** The powdered formulation of Ammonium lignosulphonate (ALS) significantly reduced the number of bacterial spot lesions on the foliage of peppers at the medium and high rates (4 and 8%). The liquid formulation of ALS was less effective than the powdered formulation showing only a slight lessening of the bacterial lesions when compared to the control. The most effective treatment was the standard KOCIDE DF + BRAVO 500 treatment in reducing bacterial spot lesions observed on pepper foliage. Pepper yields were not adversely affected with the addition of foliar applied ALS.

Under higher bacterial pressures, under irrigation neither of the ALS formulations reduced the number of bacterial spot lesions on the foliage of peppers. Bacterial spot lesion numbers however were significantly reduced using the commercial KOCIDE DF + BRAVO 500 combination. Spray applications especially KOCIDE DF + BRAVO 500 slightly lowered the number of pepper fruits harvested.

Under the moderate to high bacterial disease pressures created using the mist system devised, the ALS powder formulation proved slightly better in reducing bacterial speck foliar symptoms and the number of fruit lesions on tomato fruit than the liquid ALS formulation. Higher and more significant control of bacterial spot was observed using ALS however the differences between the powder and liquid formulations were not observed. Under this level of bacterial pressure the commercial standard program using KOCIDE DF + BRAVO 500 provided significantly higher levels of bacterial speck and spot control than either of the ALS formulations. ALS formulations were not as effective in controlling the fungal diseases of Early Blight, Septoria and fruit anthracnose as the standard KOCIDE DF + BRAVO 500 applications.

In the non irrigated or misted tomato plot plots treated with ALS showed a browning tinge to the fruit although the residue was easily washed off. This tomato cultivar was a fresh market cultivar with the concern that the discolouration would be noticed in the marketplace. ALS did not show a consistent degree of bacterial spot control until just shortly after the rainfall prior to the August 17 evaluation. The level of control was marginal yet statistically significant when compared to the untreated control. The most consistent reduction of bacterial spot lesions on the tomato foliage was observed when KOCIDE DF + BRAVO 500 was used.

Under mild bacterial disease pressure marginal levels of control were observed when using ALS formulations to control bacterial speck on tomatoes. The highest reduction of foliar lesions was observed using KOCIDE DF + BRAVO 500.

## CARBONATITE

**EVALUATION OF CARBONATITE AND TURKEY/PEAT COMBINATIONS WITH CARBONATITE IN PROCESSING VEGETABLE CROPS - 2002.** Carbonatite alone or in combination with turkey manure and deep dug black peat did not show any beneficial influence on any of the processing vegetable crops including peppers, potatoes, sugarbeets, sweet corn and tomatoes in this first year of soil amendments. Apparently the applications of these materials were not applied in sufficient quantities to affect the growth and yield in year one of applications. It is often noted with soil amendments that multiple year applications must be made before any significant effects are observed.

## MYCORRHIZAL FUNGI - MYCONATE

**EVALUATION OF MYCONATE IN PEPPERS, POTATOES, TOMATOES AND CUCUMBERS - 2002.** MYCONATE treated vegetable plants showed an increase in weight per fruit and ultimately total yields. There were very few consistently noteworthy plant growth responses throughout the growing season. In peppers there was a statistically significant increase in both fruit numbers and total pepper yields. Although not statistically significant, plant vigour ratings increased, relative to the check plots, later on in the season resulting apparently from more of the bottom pepper foliar remaining in the MYCONATE treated plots. In potatoes, yields were increased especially in the cultivar Russet Burbank where the MYCONATE appeared to increase the number of stems, but showed little differences in plant vigour ratings. MYCONATE treated plots did not reduce the incidence of potato leafhoppers in either of the potato cultivars. In tomatoes, yields were not statistically different however as in all the trials yield

numbers were higher in the MYCONATE treated plots. There was however a significant difference in the number of tomato plants that remained healthy in the plots, with fewer missing plants noted at location #1. In cucumbers MYCONATE treated plants showed a numerical increase in the average weight of harvest able cucumbers even though the number of fruits seemed to be reduced. There were a significant number of cucumber plants that remained greener in the MYCONATE treated plants. In general there was a positive effect in the growth and yield of MYCONATE treated vegetable plants. Further replications or larger plots would possibly show greater statistical significance between treatments.

**AUXIGRO**

**EFFECT OF THE METABOLIC PRIMER AUXIGRO ON THE PRODUCTION OF FIELD PEPPERS AND TOMATOES- 2002.** The application of the metabolic primer AuxiGro with or without the assistance of the surfactant Sylgard did not appear to provide any significant growth promoting activity in either peppers or tomatoes. The season was considered dry.

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