

# ONTARIO TOMATO RESEARCH INSTITUTE

## RESEARCH RESULTS

Dr. Ron Pitblado

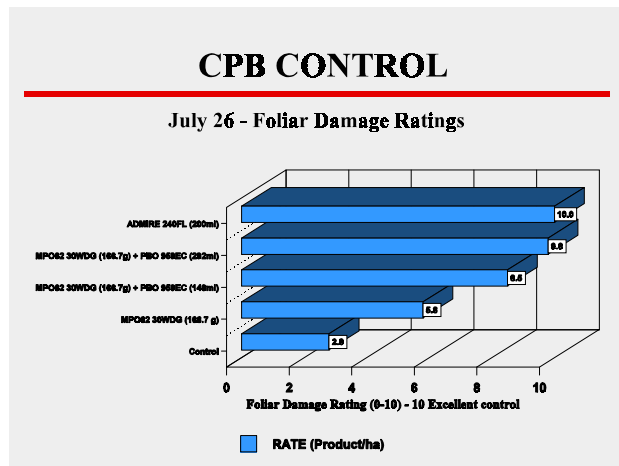
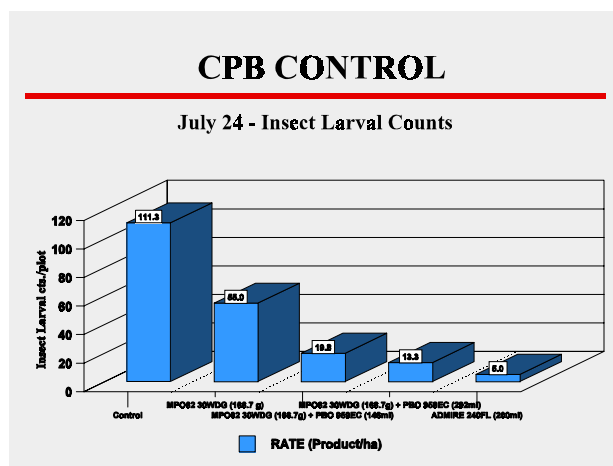
RIDGETOWN COLLEGE, University of Guelph

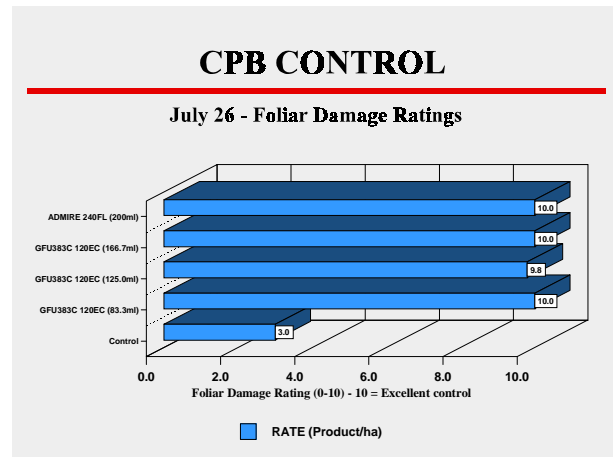
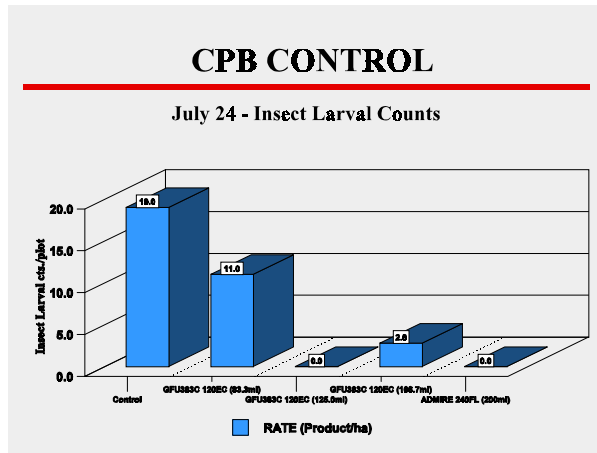
**PROJECT TITLE: THE DEVELOPMENT OF PEST MANAGEMENT STRATEGIES FOR INSECTS AND PLANT DISEASES IN PROCESSING TOMATOES - 1998**

### *OBJECTIVES and RESULTS*

#### **1. To develop control strategies for Colorado Potato Beetles attacking processing tomatoes.**

Since the introduction of the insecticide ADMIRE 240FS, Colorado Potato Beetles, no longer pose an immediate threat to the tomato processing industry. The industry of course knows that this respite from the devastation from this pest is only momentary and that we must both continue to support the data required by Health Canada to continue the registration of ADMIRE but we must also be aware of an expected reduction in its control - someday. In this we must continue to develop new alternatives to extend the value that ADMIRE has offered the tomato industry. Likewise the potato industry has also benefited from the use of ADMIRE and the trials that I conduct on potatoes regarding the effectiveness of various insect control products are transferable. This years Colorado Potato Beetle trials have identified two products of interest to the tomato industry. MPO62 30WDG from DUPONT CANADA INC., provided good control of CPB and was significantly improved with the addition of piperonyl butoxide PBO. ZENECA AGRO has a synthetic pyrethroid named GFU383C 120EC (MATADOR) which showed excellent control of CPB.



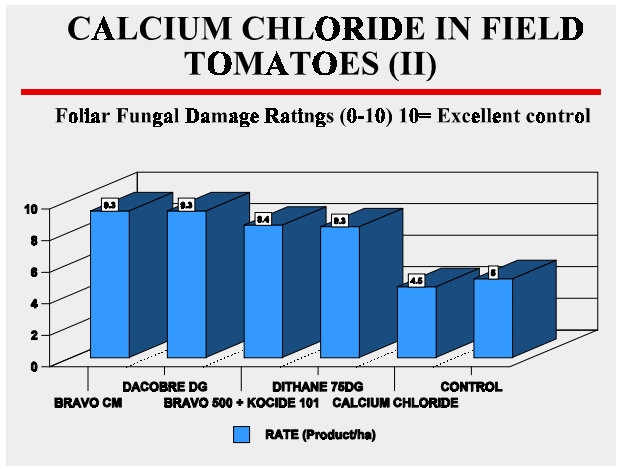
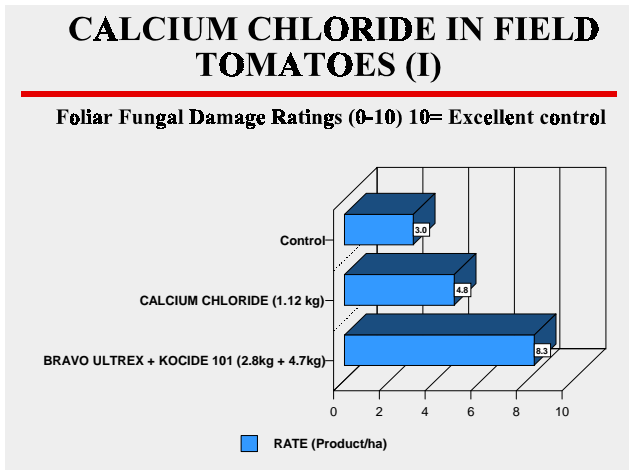
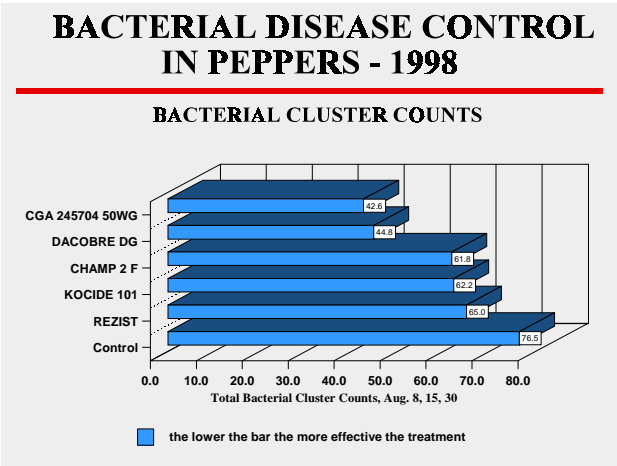
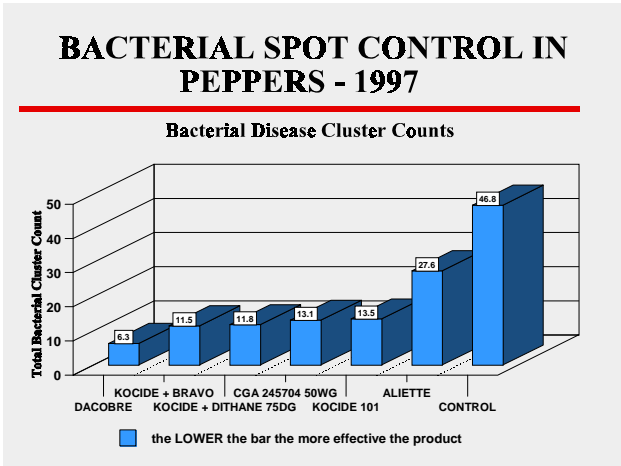


## 2. To develop control strategies for bacterial diseases in field tomatoes.

Bacterial Spot once again caused considerable concern during the 1998 growing season. It is well known that the most effective control efforts need to be focussed on clean seed, a responsibility of the seed companies, however growers would like to address field outbreaks using foliar sprays. The search for an effective bactericide for use in Ontario has been intense. Copper when used by itself has not been effective. At present the highest rated bacterial control products have been the combination of copper plus BRAVO 500 (DACOBRE or DACOBRE DG) or copper plus one of the mancozeb products. Identical treatments have been applied to both tomatoes and peppers to determine the relative effectiveness of candidate bactericides. I am including information from both 1997 and 98 pepper trials which have relevance to tomato bacterial control strategies.

The most effective control of bacterial spot was using a commercially prepared combination of copper plus chlorothalonil (BRAVO 500) called DACOBRE DG. Tank mixes of these ingredients as well with combinations including DITHANE 75DG with copper were also effective, but to a lesser extent. A new relatively effective product from NOVARTIS called CGA 245704 50WG is showing promise, however the level of bacterial spot control is no greater than DACOBRE DG. Interest was expressed in the effectiveness of ALIETTE, however in my 1997 trial Aliette was less effective than CGA 245704 50WG and the copper combinations with chlorothalonil and mancozeb. Commercial interest was expressed in a product sold as a bactericide for tomatoes called REZIST. It proved ineffective in my trials. Many of these products were evaluated for their foliar fungal disease control potentials which are listed in the next objective's graphs.

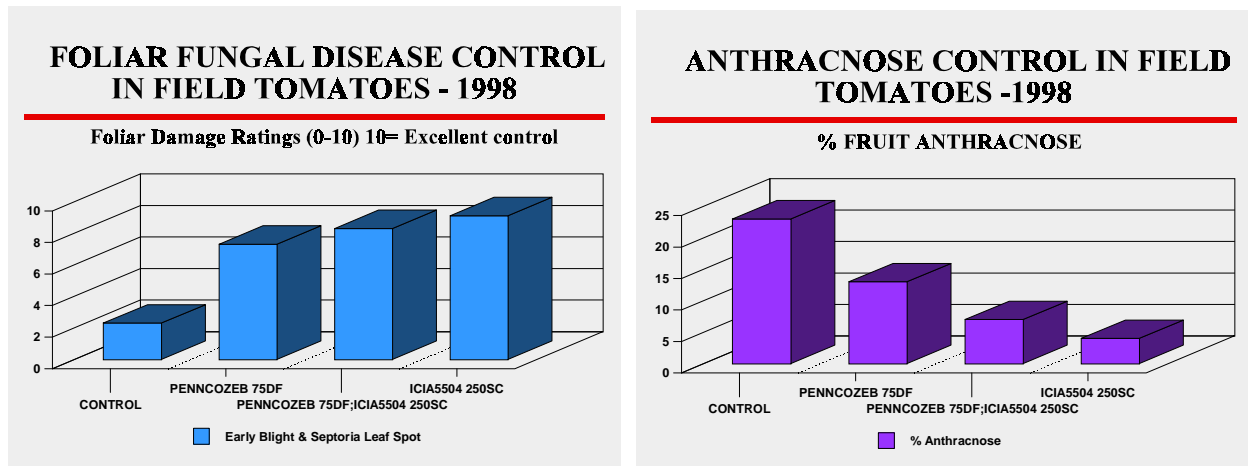
I have attempted to evaluate calcium chloride as a product to reduce the incidence of bacterial diseases in tomatoes. Unfortunately where I have tested calcium chloride, the level of bacterial disease pressures were too low to be evaluated. The effect of calcium chloride in fungal diseases was evaluated as shown in the graphs. Calcium Chloride is not an effective fungicide in tomatoes.



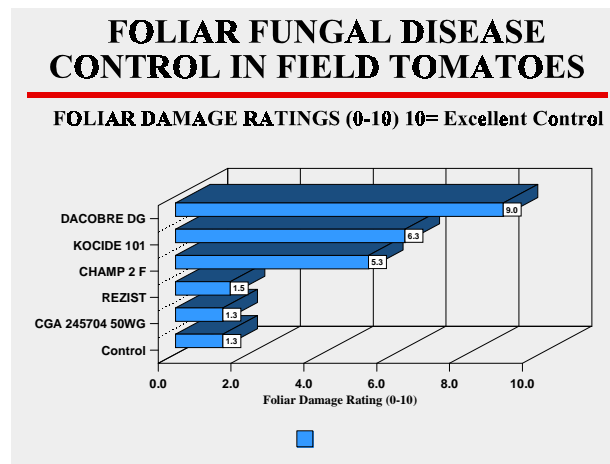
### 3.To develop control strategies for foliar fungal diseases in field tomatoes.

Two types of approaches are taken to develop control strategies for fungal diseases in field tomatoes. One is an evaluation of new candidate fungicides while the other is to enhance the effectiveness of TOM-CAST. The latter will be discussed in point 5.

As ADMIRE was to insect control so will the new fungicide from ZENECA called ICIA5504 250SC be to fungal diseases of tomatoes. ICIA5504 containing the active ingredient azoxystrobin, originally derived from mushrooms, has shown effective control of both foliar and fruit diseases of tomatoes.



The objective to identify effective bactericides for the control of bacterial spot in tomatoes has been indicated in objective #3. These same products have been evaluated for their foliar fungal control capabilities. DACOBRE DG has provided the only commercially acceptable fungal disease control of the bactericides examined.



#### 4. To evaluate a new rapid method of nematode detection to provide guidance for the control of plant parasitic nematodes in field tomatoes.

In collaboration with Dr. Ross Nazar, I was to evaluate a PCR-based diagnostic tool for both Verticillium and nematodes attacking tomatoes. The expectation was to develop a fast, sensitive one sept diagnostic tool whereupon control decision could be made. Due to unforeseen problems

in the laboratory the product was not delivered to Ridgetown for evaluation. The ideal and future implementation remains a priority.

### **5.To develop a protocol for monitoring pest changes over time using GPS mapping procedures.**

The objective is to develop and provide weather information from remote sources including land, radar and satellite stations on a site-specific near real-time (field scale) basis with valued added products such as TOM-CAST to assist growers in making crop management decisions. A graduate student was identified to assist in this endeavour, Jen Winter. At present we have been working with Agricornp to develop a detailed map of tomato fields throughout Kent and Essex counties. Tomato fields were georeferenced with the Global Positioning Systems (GPS) utilizing Trimble GPS backpack units by Agricornp. The fields were initially mapped using the Trimble Pathfinder software. In total, there were approximately 600-700 tomato fields GPS'd and mapped. These fields were then combined into 45 separate files. These files were aggregated within ArcView (ESRI Inc., Redlands, California) to develop a single composite map of the existing tomato fields. Each tomato field was then referenced by the Universal Transverse Mercator (UTM) projection. The datum associated with these fields was Nad 27, however for our purposes to be used and superimposed on topographical and transportation maps previous taken it was reprojected into Nad 83. Nad 83 is the accepted datum for Canada. Therefore by reprojecting the fields we ensure standardization across the existing map layers. Following the reprojection, the referenced tomato fields were then overlaid onto a LANDSAT image. A soil and a primary road network map are also incorporated within this LANDSAT satellite image. The final output image will be produced with AGROMA (PCI) software.

This is the first stage of determining site-specific weather data in these two counties.