

ONTARIO TOMATO RESEARCH INSTITUTE

THE ESTABLISHMENT OF A DIAGNOSTIC LABORATORY USING PCR TECHNOLOGY AT RIDGETOWN COLLEGE

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BACKGROUND AND ANTICIPATED BENEFITS TO THE INDUSTRY

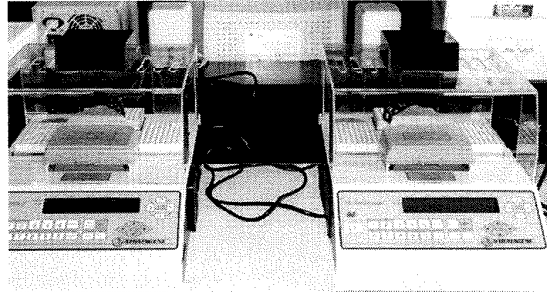
Considerable provincial, federal and commodity board monies have been invested in developing fast, reliable, PRC techniques to identify and quantify tomato diseases. Researchers have left the delivery and implementation of their new diagnostic discoveries for OMAF to utilize. Currently there have been concerted efforts to utilize the services of the Guelph Diagnostic Laboratory, however all efforts have failed to convince this laboratory to run these techniques. Part of the reason is the growers in Essex and Chatham-Kent counties feel that it takes too much time to package and send samples to Guelph and partially the Guelph laboratory needs to assure itself that the exercise is cost effective. It is critical to determine the feasibility and the value of this research however no one has been prepared to invest and risk the expense necessary to run these tests on a routine basis. It is Ridgetown's hope that a protocol can be worked out to determine the feasibility of operating such a laboratory.

This proposal has the potential of helping growers in ways not yet appreciated or understood. The industry needs to consider whether we give this a try or discourage the development of this technology in Ontario. According to the priorities identified by the Ontario Tomato Research Institute this proposal addressed item #3, "development of diagnostic tools and disease screening of seed and improved methods for detection of bacterial spot in plug plants."

2002 ACTIVITIES

Considerable consultation between the newly to be developed PCR laboratory at Ridgetown College and Dr. Diane Cuppels, AAFC, London was undertaken in late winter of 2002 and the spring collection period. Personnel involved with the development;

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| AAFC, London | Dr. Diane Cuppels Terry Ainsworth |
| Ridgetown College | Dr. Ron Pitblado Phyllis May Sandra Slomp Dr. Lilly Tamburi Yvonne McLellan |



Ridgetown hired two technicians and a laboratory supervisor to undertake the establishment of this new lab. The initial investigation took place in an existing microbiological laboratory supervised by Dr. Art Schaafsma. Later, specific equipment necessary for the undertaking of such a process was borrowed from Dr. Diane Cuppels laboratory with the expendables purchased as required.

The set up had as its premise to understand the complexities of conducting a user fee diagnostic laboratory service to be able to facilitate and encourage a private laboratory to pick up this initiative using this technology for use by grower groups in Ontario.

The project had to be considerably modified from the initial proposal to reflect the funding formulae required by the OTRI research directors, however I believed the process was sufficient to gain some of the necessary information to proceed on to the next stage which will be described later.

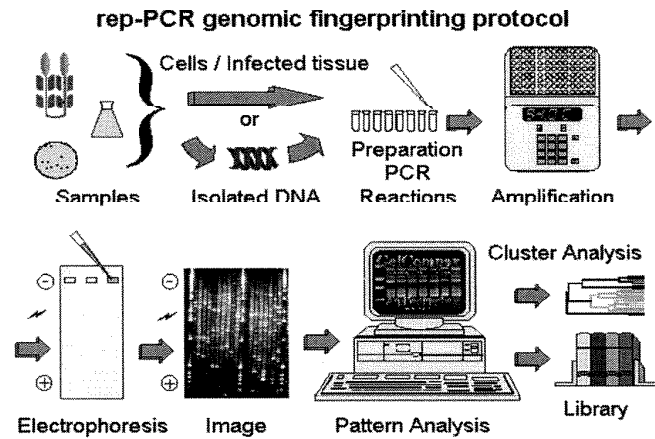
Although the initial intent was to encourage numerous growers and industry representatives to utilize this service as suggested by the enclosed letter to the industry, it was decided, due to the funding requirements to limit our efforts

and work with two tomato consultants whom we could get the necessary background information and to work on a much reduced number of samples.

RESULTS

Ridgetown College processed 43 grower samples.

There were numerous adjustments that needed to be made due to inadequate personnel training, scattered equipment resulting in contaminated samples, an initial problem with the thermocycler, etc. At first, many of the leaf samples received had no lesions. This technique was not designed for symptomless tomatoes which disappointed some. The first samples we did had too much material and allowed too much chlorophyll to elute into the solution. Although the techniques are well known to laboratories who conduct PCRs on a routine basis a significant training period will be needed if the laboratory interested in providing this service in a longer term does not have existing trained staff. Our experience and more importantly the proven experience from Diane Cuppel's laboratory in London will be needed in the next phase of this project.



NEXT PHASE

With the background gained by conducting this laboratory during the summer of 2002, Ridgetown organized several meetings with a laboratory that in my experience has the necessary equipment and trained personnel to run PCR commercially for the processing vegetable industry. I brought together Garry Palmeteer, manager of the GAP EnviroMicrobial Services located at 1020 Hargrieve Road, Unit 14 in London, Ontario and his technical manager, Michele Van Dyke and developed a working relationship to bring them up to date to the needs for a commercial laboratory to run such samples. They expressed an initial interest. I then brought together two tomato consultants, Ed Tomecek and Chris Thomas along with several OMAF staff Kristen Callow and Janice LeBoeuf to discuss the commercial opportunities for rapid identification technologies for vegetable growers in Ontario. GAP is developing a business case and will get back to us regarding further interest.

