Using antagonistic bacteria for control of bacterial wilt of tomato

THREE ANTAGONISTIC bacteria, *Bacillus cereus*, *Pseudomonas aeruginosa*, and *P. pulida*, were used to control bacterial wilt (*P. solanacearum*) of tomato cv. Pep. T. K. under glasshouse conditions. The experiment consisted of eight treatments. The results revealed that antagonistic bacteria caused approximately 28% reduction of wilted plants, while inoculated tomato plants without antagonists had 58% wilted plants. The difference was highly significant at 95%. The field experiment was divided into five treatments, and the tomato plants in all treatments were naturally infected. Results showed that when *B. cereus* and the mixture of three antagonists were applied, wilting was slightly reduced. However, it was not significantly different from the control.

For further information, contact Kanjana Vichittragoontavorn and Nuchanart Jonglaedha, Highland Plant Protection Section, Royal Project Foundation, Chiang Mai, Thailand.

Effect of hydro-cooling on storage life of green soybean (*Glycine max* L.)

GREEN soybeans were cooled by using water temperatures of 0, 2, and 5°C. The cooling time obtained were 4.3, 2.3, and 1.3 min, respectively. After packing the green soybeans in polypropylene bags, these were stored at 3°C for 27 days. Green soybeans cooled with water temperatures of 2 and 5°C had less change in peel color, whereas, there were no significant changes in weight loss, total soluble solids, and starch content among the treatments. Oxygen and carbon dioxide content in headspace were 5-12% and 10-18%, respectively, and there was no ethylene detected during storage.

For further information, contact Department of Post-harvest Technology, Faculty of Engineering and Agro-industry, Maejo University, Chiang Mai 50290, Thailand.

Fertigation for cut chrysanthemum

CUT CHRYSANTHEMUM cv. Puma, Stroika, and J25 were grown at the Chiengrai Horticultural Research Centre in 1997. By using the fertigation technique, studies were designed to find out whether fertilizer rate used by farmers could be decreased by 50%, and whether fertilizer rate obtained from plant analysis could be used effectively. The chrysanthemum flowers obtained with decreased fertilizer rate, and those with fertilizer rate derived from plant analysis, were still of standard quality. This indicates that amount of fertilizer can be reduced by more than 50% of what the farmers normally use. The fertilizer rate obtained from plant analysis can also be used effectively to grow chrysanthemum.

For further information, contact Chiengrai Horticultural Research Centre, P.O. Box 39, Chiang Rai 57000, Thailand.

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Food and Fertilizer Technology Center (FFTC)
14 Wenchow St., Taipei, Taiwan ROC
Tel.: (886 2) 2362 6239 Fax: (886 2) 2362 0478
E-mail: fftc@agnet.org Website: www.fftc.agnet.org

Biological control of nematodes

Use of nematophagous fungi in feces to control gastrointestinal nematodes

THIS STUDY evaluated the ability of a nematophagous fungus to destroy free-living nematodes in fecal samples and produce its chlamydospores in large scale. One local isolate of nematophagous fungus, *Arthrobotrys oligospora*, obtained from soil samples was used in this study. Germination of conidia or chlamydospores and three-dimensional adhesive net formation for trapping free-living nematodes were observed *in vitro*. These were done to test the resistance of conidia or chlamydospores after they have passed through the alimentary tracts of animals. Four 1.5-month-old male dairy calves were used in experiment 1. Conidia of *A. oligospora* were individually administered orally to the calves at a variable dosage of 1×10^6-4×10^6 conidia per kilogram body weight per calf. Germination and three-dimensional nets were observed in fecal samples within 2 days after the experiment. Free-living stage of bovine gastrointestinal nematodes trapped by the nets was observed in day 5 of the experiment. Four BAL/C mice were used in experiment 2. Individually, the mice were orally administered with chlamydospores of *A. oligospora* which had been kept in water for 1 year. Germination and three-dimensional nets were also observed in fecal samples within 2 days after the experiment. Free living rhabditoid nematodes trapped by the nets were seen within 2-3 weeks of the experiment. Mass production of chlamydospores was successful in this study. The best medium for hyphal growth of *A. oligospora* was potato dextrose broth (PDB). The chlamydospores were achieved after replacement of PDB with water in the same flask. The results indicate that a local isolate of *A. oligospora* has the potential as a biological control of free-living bovine gastrointestinal nematodes by oral administration of conidia.

For further information, contact National Institute of Animal Health, Department of Livestock Development, Ministry of Agriculture and Cooperatives, Chatuchak, Bangkok, Thailand.

Determining seed correctness and purity of hybrid seed lots

Use of fluorescent spectrophotometry and capillary electrophoresis

FLUORESCENT spectrophotometry and capillary electrophoresis on seed are important in determining seed correctness and purity of rice hybrid seed. This new technique allows the identification of the correctness and purity of seed lots in the laboratory, minimizing costs, time, and other problems met in conventional methods.

Densitometer CS-9301 PC was used for fluorescent spectrophotometry with fluorescent lighting of 540-600 nm. Equipment P/ACE System 5510 was used for capillary electrophoresis (CE) with method free zone CE. Protocol for the use of fluorescent spectrophotometry to distinguish rice hybrid cultivars and to determine purity of hybrid seed lots introduced from China was completely developed. Specific peaks of some Chinese rice hybrid varieties such as Shan You 63, Nhi Uu 501, Boi Tap, Son Thanh, and others were clearly obtained. Based on these specific peaks, it was easy to recognize the name of each variety introduced from a China hybrid variety. The use of capillary electrophoresis of two proteins (glutelin and prolamin) extracted from rice seeds also helped to distinguish the difference between hybrid seed lots.

The results obtained showed that the two new techniques can be used for proper and rapid determination of seed correctness and purity of introduced rice hybrid varieties. These techniques save time but require high investment for equipment and chemicals.

News source: **Department of Agriculture and Forestry Extension, MARD, Vietnam**

For further information, see *Science & Technology Journal of Agriculture and Rural Development*, No. 8, 2002, pp.678-680.