**REPORT ON THE INTERNATIONAL PLANT VIRUS EPIDEMIOLOGY WORKSHOP – AT CANTERBURY UNIVERSITY, NEW ZEALAND, 31 JANUARY, 2003**

This successful 1 day international workshop was held at Canterbury University in Christchurch, South Island, New Zealand immediately before the 8th International Congress of Plant Pathology in Christchurch. The workshop was attended by 48 participants from 10 different countries. It was held under the auspices of the Plant Virus Epidemiology Committee of the International Society for Plant Pathology. The workshop was entitled "Plant Virus Epidemiology Workshop – Applying Research to solve Practical Farming Problems", and its principal objective was "to demonstrate how an understanding of the epidemiology of aphid and thrips vectored plant viruses can be applied to limit losses caused by virus diseases, and give real benefits to farmers worldwide". There was a blend of developed and developing country contributions, with a total of 16 talks. The program started on the morning of Friday 31st January with registration and a welcome from the local organiser, Dr John Fletcher of the New Zealand Institute for Crop and Food Research at Lincoln, just outside Christchurch.

The opening session was on cereal virus diseases". It commenced with a paper by Thackray (Australia), presented in her absence by Jones (Australia), that described a well-validated simulation model that uses pre-growing season rainfall to forecast aphid outbreaks and barley yellow dwarf virus (BYDV) epidemics in cereals in a typical Mediterranean-type environment. Predictions for date of aphid arrival, amount of virus spread, yield losses and the need for early insecticide sprays are provided. Next, Teulon (New Zealand) described a forecasting model for BYDV and cereal aphids for a temperate climate that uses aphid catches in suction traps to make similar predictions. Data from 15 years of suction trapping was employed to establish the relationship between cereal aphid numbers caught and the BYDV epidemics that occur subsequently. Salomon (Israel) then described devastating yield losses in early-planted sweet corn in the Jordan Valley caused by mixed infection with maize dwarf mosaic and zea mosaic viruses spreading from the local Johnsongrass virus reservoir.

The second session was on viruses of potato and vegetable crops. First, Singh (Canada) described a forecasting system to predict the proportion of harvested potato tubers infected with potato leaf roll and potato Y (PVY) viruses in seed potato crops. Information from pan-trapped aphids and large-scale RT-PCR testing of young tuber samples from seed potato crops provided the basis on which the predictions were based. Next, Van der Vlught (The Netherlands) talked on the molecular epidemiology of PVY strains from potato, pepper, tomato and tobacco. PVY-NTN, the cause of the potato tuber necrotic ringspot disease, is derived from recombination events between different PVY strains and three 'hot spots' in its sequence have been identified. Latham (Australia) then described the epidemiology and control of carrot virus Y, a recently detected potyvirus causing damaging root symptoms in carrots that is widespread in Australia, but has not so far been recorded elsewhere. Continuous carrot production all-year-round increases incidence and leads to serious epidemics and losses. Next Fletcher (New Zealand) described aphid-borne virus epidemics in squash causing widespread fruit symptoms of sunburn and deformation. Zucchini yellow mosaic and watermelon mosaic virus 2 were the causal agents. Amount of shelter, prevailing winds and extent of weed reservoirs were the key factors influencing the magnitude of the epidemics.

The third session was on legume viruses. Makkouk (ICARDA) gave an overview of the incidence of aphid-borne viruses infecting cool-season food legumes in West Asia and North Africa. Five persistently and ten non-persistently aphid-borne viruses were found. In-depth surveys revealed that the spectrum, incidence and economic impact of these viruses varies greatly from county to country depending on environmental conditions. Overall, the pea aphid was the most important virus vector, and the most economically important viruses were faba bean necrotic yellows, bean leaf roll and bean yellow mosaic. Willekens (UK) then discussed management of groundnut rosette disease in sub-Saharan Africa. The importance of deploying cultivars with resistance to the virus and to its aphid vector and the obstacles in getting these adopted by local peasant farmers were emphasised.

The fourth session was on thrips-transmitted viruses. Sharman (Australia) described the spread of the new capsicum chlorosis tospovirus in Queensland where it is rapidly displacing tomato spotted wilt tospovirus (TSWV) as the most widespread virus disease in pepper and tomato crops. A breeding line of pepper is resistant to both viruses. In addition, spread of a resistance-breaking strain of TSWV that overcomes gene *Tsw* in pepper was reported. Coutts (Australia) then discussed analysis of the spatial patterns of spread of TSWV in lettuce and pepper crops, and drew conclusions as regards safe planting distances as part of an integrated disease management approach. The program SADIE proved very effective for the spatial analysis of the data. Next, Gera (Israel) described the rapidly increasing worldwide distribution of iris yellow spot virus on onion, the 'straw bleaching' disease it causes and its severe impact on production. In an epidemic situation, a very high proportion of incoming *Thrips tabaci* vectors may carry and transmit the virus. Overlapping onion sowings all-year-round maximise its incidence.

The fifth and final session concerned regional case studies. Stevens (UK) discussed a forecasting system that predicts the risk of infection and losses caused by the virus yellows complex in sugar beet in a temperate climate. Beet yellows, beet mild yellowing and beet chlorosis virus, all transmitted by aphids, are the three viral components of the virus complex. The forecast is based mainly on the number of ground frosts in winter and the timing of aphid migrations as determined by trap catches. However, the model is relatively little used to predict when foliar applied insecticides are needed for virus control because 78% of the beet seed sown in the UK is dressed with the insecticide imidacloprid before sowing, the forecast being provided too late. Colvin (UK) then described how extension of control measures against the whitefly-borne tomato yellow leaf curl virus in southern India has been undertaken in such a way as to optimise adoption. Participation of small farmers in decision making was critical to achieve uptake. One of the novel control measures being recommended involved deploying a fabric barrier with a yellow strip sprayed with insecticide to attract and kill whitefly vectors along its middle. The last talk was given by Pearson (New Zealand) on virus diseases in the South Pacific, especially those of little studied crops like yam, taro, vanilla and kava. Use of healthy planting material and preventing contact-transmission was more important in their management than vector control. Finally, Jones (Australia) provided a summarised account of the 8$^{th}$ International Symposium organised by the Epidemiology group at Aschersleben, Germany in May, 2002 and then a brief summary of the outcomes of the New Zealand workshop. To round off the day, participants met for dinner later in the evening at the University of Canterbury.

This 1 day workshop successfully achieved its objective of 'applying research to solve practical farming problems' and maintained the high standards set by past

Symposia organised by the International Virus Epidemiology Group (held every three years). John Fletcher and his support team from Lincoln, New Zealand (Jan Latham, Helen Shrewsbury, Marlene Jaspers and Virginia Morroni) are to be congratulated warmly over a job well done. Abstracts of the talks will be published in the journal Australasian Plant Pathology in due course.

Roger Jones, 31/3/03