A VIRUS IN THE SYSTEM

A major theme in the CPP is the use of naturally occurring insect pathogens to replace chemical pesticides as a way of controlling insect pests. Insect-specific viruses such as nucleopolyhedroviruses (NPV) can control major pests that have become resistant to chemical insecticides without being detrimental to the environment or human health.

Trial spraying of NPV on Diamondback moth.

In Kenya, Diamondback moth is the major pest constraint for small vegetable growers because the caterpillar stages, which are voracious feeders, have become resistant to local pesticides. It is estimated that, globally, they cause crop losses of US$ 1 billion annually. One CPP project (R7449) investigated alternative non-chemical controls and discovered a local granulovirus (GV) that was highly pathogenic to this pest. Field trials showed that weekly sprays of this virus are much more effective than chemical pesticides at reducing pest damage. Subsequent molecular investigations revealed that at least 14 different strains of this virus exist in Kenya and these are now being studied to determine the best strain for field use.

In East Africa another important pest is the armyworm, which erupts from outbreak areas in Tanzania to ravage pastureland and cereals over much of sub-Saharan Africa. As an alternative to large-scale spraying of chemicals in the outbreak areas, NPV is being evaluated for strategic control to suppress population outbreaks before they can spread onto farms (R7966). This very specific NPV, which infects only the armyworm, is safe and can be used in environmentally sensitive rangeland and national parks.

The project is developing a cheap local NPV production system which is appropriate for this very poor country.

African armyworm

Local production of NPV is crucial for ensuring the sustainability of biological pesticide uptake. A previous project in India (R5540) developed the use of *Helicoverpa armigera* NPV (HaNPV) as a control agent for the podborer *H. armigera,* the most damaging world-wide pest of legumes, vegetables and cotton, and also promoted local production. Training courses were held in the production and quality control of NPV biopesticides for local scientists from both the private and public sectors between 1994 and 1997.

Although this project ended in 1997, substantial production of NPV has continued in the private commercial sector. Over 20 small to medium enterprises have been set up in India, supplying local demand, but also seeking export markets in developed countries. Initiatives for setting up NGO, village level and local state production of HaNPV have been funded by the Government of India, State governments and other donors, such as IFAD.

Employees of an enterprise established by a participant of the NPV training courses.

The use of HaNPV is now being promoted to 800 farmers in rural Nepal (R7885). This is a key part of a package of improved crop management to control the podborer. The combined impact of this pest and crop diseases has rendered the cultivation of chickpea, a vital food legume in this protein-starved country, impossible over large areas of Nepal. By promoting new disease-resistant varieties and NPV for effective pest control, this crop can be rehabilitated and the nutritional status and income of poor rural families significantly improved.

Through projects R7299 and R7923 analyses of uptake of NPV-based products and production are being carried out to guide the promotion of results from both current and completed projects.

R7299 and R7966: D Grzywacz (NRI), R7885: P Stephenson (NRI), R7923: R Tripp (ODI)

FEEDBACK TO THE CROP PROTECTION PROGRAMME

Throughout 2000/2001 encouraging reports have been received from producers of NPV (http://www.biotech-int.com/, http://www.ajaybio.com/, and other producers in India can be located through http://www.indiamart.com/). In December the programme was visited by D R Venkatesh from SAM AgriTech Limited based in Puduru Village, near Hyderabad. The company is producing a strain of HaNPV, registered as SAMSTAR which has been accepted by the Australian Quarantine and Inspection Service (AQIS) for import into Australia. Their intention is to be able to manufacture 100,000 litres.

Below is a copy of a letter that was sent to us by an Indian NGO:

CENTRE FOR WORLD SOLARITY

H_ No. 12-13-438. Street No 1, Tarnaka. Secunderabad - 500 017. A.P. India
Fax 0091 - 40 - 7018257, Phone 7017735, E-Mail : cwsy@hd1.vsnl.net.In

Dr. M.S. Chari
Advisor-Pest Management

April 3,2001

Department For International Development (DFID) Crop Protection Programme Natural Resource International Ltd Central avenue, Chetham Maritime Kent ME 44 TB, United Kingdom.

Sub: Successful Village Level NPV Production

I would like to inform you that the above project has been taken up for NPV production at 7 locations in India. These village level N'PV production units were collaborated with NGOs and State Agricultural Universities with the active involvement of Farmers. During the crop season (2000-2001) these production units touched a target production up to 0.2 million Larval Equivalent (LE) and used this locally produced virus against *Helicoverpa armigera on* chickpea, pigeonpea and cotton. We are pleased to share this success story-with you, as this was the world's first initiative of village level NPV production which was known to be the basic constraint to scale up the NPV technology in the past. This project gave ample opportunity with the effective partnership between ICRISAT and CWS. We feel it is a good start and it has to go a long way with further improvements and amendments for quality production. All the farmers and NGO partners in this project appreciated the support given by Department for International Development (DFID) and ICRISAT. Hope this type of project would further strengthen to meet the on going demand of NPV and also solve the problems of environmental degradation and operational hazards due to toxic pesticides. Assuring our best sen7ces and cooperation.

Yours faithfully,

(M.S.C. CHARI)