

## Natural products

### ...award for nematode technology

Ecogrow Australia Pty Ltd has won the Best Emerging Product in the Biotechnology, Health and Medical awards during the first ACT Research and Development Grant Scheme Awards. The firm is developing and will commercialise CSIRO's entomo-pathogenic (insect killing) nematode technology. The firm is also planning to set up a pilot manufacturing plant and is considering setting up a permanent facility near CSIRO's Black Mountain Labs in Canberra, Australia (<http://www.ecogrow.com.au/>)

### ...natural potato sprout inhibitors

The US Agriculture Research Service has patented new natural compounds that are effective in preventing the sprouting of potatoes in storage. The currently used product, chlorpropham (CIPC), is becoming increasingly regulated and organic growers cannot use it. It has been shown that jasmonates used at low concentrations prevent sprouting and also improve the colour of processed potatoes. ARS is seeking a collaborator to help develop the product.

### ...increased demand for biopesticides

The European market for biopesticides is currently valued at around \$98 M and according to a new study by Frost and Sullivan it will grow by 11%/y to reach \$210 M by 2007. The study divided biopesticides into micro-organisms, predatory insects, and pheromones and pheromone traps. Frost and Sullivan believes that environmental legislation, taxes, and consumer demand will make biopesticides a growth sector.

### ...new 'natural' herbicides?

The US Agricultural Research Service has a vast collection of fungi in its collection in Beltsville and it is investigating the potential of some of these to control alien invasive weeds in the USA. For example, a new species of *Septoria* (*S. epambrosiae*) has been shown to infect ragweed (*Ambrosia*), *Harknessia lythrii* has been shown to attack purple loosestrife (*Lythrum salicornia*) and two different strains of *Myrothecium verrucaria* are effective against kudzu (*Pueraria montana* var *lobata*) and morning glories (*Ipomoea* spp). Trials are underway. Meanwhile, in Australia, CSIRO researchers have evaluated the use of the South American beetle, *Deuterocampta quadrijuga*, to control the invasive blue heliotrope,

*Heliotropum amplexicaule*, an alien weed that was imported from South America. The beetle has been shown to be specific to the blue heliotrope and it has been released into infested areas of New South Wales.

### ...Colorado potato beetle control

Work by the ARS in Beltsville has shown that the bacterium, *Photobhabdus luminescens* causes the Colorado potato beetle (*Leptinotarsa decemlineata*) to stop feeding and subsequently die. The mechanism of action is unknown but trials are continuing.

## Surfactants

### ...organosilicon plant growth accelerator

CNPC Jilin Petrochemical Co Ltd has developed a new organosilicon plant growth accelerator. The esterification process utilises a comprehensive absorber and low-temperature solvent-free reaction. Its unique features are high reaction yield and low acid content. Application for a patent in China has already been made. The product produced using the process has a purity of over 98%, higher than the purity (97%) of imported products. It is non-toxic and safe to handle. Its mode of action is to promote cell mitosis, enhance plant photosynthesis and raise crop yield. Crops treated by the product can have a much stronger resistance to diseases, droughts, coldness and lodging.

### ...sulfosulfuron booster

Natal University, South Africa, claims that an old fashioned additive, allopurinol plus molybdenum monolaurate, significantly boosts the activity of Monsanto's brome herbicide sulfosulfuron (Monitor) on wild oats. The additive is described as non-toxic and environmentally friendly. It is manufactured in China but has no interest to Western companies as it is too cheap to make a reasonable margin. The University believes there are sound grounds to include it in the sulfosulfuron formulation.

### ...meeting

The SCI Crop Protection Group is to hold a meeting on surfactants on 3 December 2002 in London (see <http://www.soci.org>)

## New chemistry

### ...new household insecticide

Sumitomo Chemical will launch a pyrethroid based home insecticide product in 2002. Sales of Yen 10 bn/y are expected (current turnover in this segment is Yen 40

bn/y). Other product launches are planned for the next four years.

## New formulations

### ...cuprous oxide for broad-spectrum disease control

Cuprous oxide is widely used by horticultural growers and arable farmers to control a broad spectrum of crop fungi. The product also has the unique ability to control other crop yield-limiting agents such as molluscs, lichens, algae and bacteria. American Chemet of the USA is offering AG Copp 75 (75% active copper). This novel fungicide product has been custom-designed to offer more flexibility in spraying frequency and dosage, and improved cost effectiveness. It exhibits a high surface area-to-mass ratio, high tenacity and weather resistance.

### ...herbicide formulation from Aventis

Aventis CropScience has launched a new post-emergence herbicide, code named O4H, which should help growers having problems controlling difficult and resistant grass weeds. Based on a combination of new herbicides mesosulfuron-methyl and iodosulfuron, plus crop safener mefenpyr-diethyl, O4H will offer a new standard of control, according to Aventis. A key benefit of the new product is its consistency. A concern is that growers may overuse it. The safener, fenoxaprop-P-ethyl, allows use on winter, spring and durum wheat, rye and triticale. It is not suitable for use on barley. It is hoped that approval of a co-formulation with another new sulfonylurea herbicide will be obtained in time for autumn 2002.

### ...DuPont debuts XP

DuPont Crop Protection has developed DuPont Oust XP herbicide, which is formulated using its XP Technology. The product will be launched in early 2002. The firm also plans to launch a new XP grade, dubbed Escort XP, by mid 2002. The XP Technology enhances herbicide resuspension and solubility, thereby enhancing product efficacy. It also helps eliminate pump problems and clogging.

### ...granular IPU

In the UK growers hope that restriction zone legislation for the popular herbicide isoproturon (IPU) has been staved off, following dramatic changes in usage during

3Q 2001. Sales figures indicate growers have reduced dependence on this key herbicide. Increased attention to stewardship guidelines by growers is reported and sales of granular IPU formulations, which can help reduce the risk of point source pollution, have risen substantially. Use of pendimethalin (Stomp) and clodinafop-propargyl plus trifluralin (Hawk), clodinafop-propargyl plus diflufenican (Amazone) and pendimethalin plus flufenacet (Crystal) have all helped to reduce dependence on IPU. Where IPU has been used, granular formulations have represented about 70% of companies' deliveries, helping growers to reduce point source pollution risks.

### New uses

...clomazone scores well

According to research carried out by the Dutch Institute of Sugar Beet Research in Bergen Op Zoom, oilseed rape herbicide Centium 360 CS (clomazone) offers better control of polygonums and cleavers in sugar beet than metamitron, provided soils are sufficiently moist after application. UK approval of FMC's clomazone for use on sugar beet, pulses and potatoes is planned for the next growing season (*Proceedings of the 2001 BCPC Conference – Weeds, 55-62*).

### New approaches

...coffee berry borers sex ratio

The coffee berry borer (*Hypothenemus hampei*) causes an estimated \$500 million annual loss worldwide. The sex ratio of the borer is skewed 10 to 1 favouring females and this increases the level of damage caused by the pest as females emerge from the coffee berry already inseminated and in less than one day they enter a new berry and lay eggs. The bacterium *Wolbachia* has been found to be associated with the borer isolated from many different locations and it is thought that this bacterium is responsible for the skewed sex ratio. Trials are underway at USDA-ARS to determine if the removal of the bacterium causes the sex ratio to change and subsequently to reduce the level of damage.

....electron bombardment of seeds

Schmidt, a German grain handling company, believes that its novel electron bombardment of seeds could replace chemical seed treatment. This would mean crop protection could be achieved at a fraction of the cost currently paid out by farmers to agrochemical companies. There would be no adverse environmental effects. Eventually the new technology is expected

to be developed to the point that it will cost just 20% of current pesticide costs (<http://www.schmidt-ag.de/>).

...negative cross-resistance

A method of clogging the "pesticide treadmill" has been announced by two American researchers, one at the University of Wisconsin-Madison, the other at Purdue University. The development by insects of resistance to new insecticides is known as the pesticide treadmill, forcing continuous development of new insecticides. The researchers call their method "negative cross resistance". The technique uses mixtures of insecticides, and the researchers believe that it could delay the development of insect resistance for decades.

...mosquito control

Agnique® MMF from Cognis, offers outstanding biodegradability and is an effective weapon in the fight against mosquitoes. The product works by spreading as a monomolecular layer on standing water, reducing surface tension. This film reduces the surface tension of the water and makes it difficult for the larvae and pupae to attach. The film also blocks their breathing tubes and the larvae and pupae drown. Resting males and egg-laying females that come in contact with the film will also drown. Mosquito control begins minutes after application, and laboratory and field testing has shown the film to remain potent for 10 to 14 days. Agnique® MMF utilizes a special alcohol ethoxylate to achieve the impressive spreadability. Agnique is insoluble in water, has no effect on dissolved oxygen, the pH value or fluidity. It is not toxic to fish and also does not pollute the surrounding vegetation. (<http://www.cognis.com> or <http://www.mosquitommf.com/mosquito/>).

### R&D spending unsustainable

Syngenta considers that the present levels of expenditure by big companies on crop protection R&D cannot be maintained. The average for the industry is 11% of sales. The global market is expected to grow at 2-4%/y. Syngenta is to reduce its R&D expenditure. Syngenta spent \$745 M on R&D in 2000, with \$473 M on crop protection, \$111 M on seed development and \$161 on development of new technology. Syngenta is reducing the number of active ingredients it sells from 121 to 76 over the coming 3 years. The 45 reduction comprises 12 divestments and 33 being phased out. In 2000, Syngenta revenue from crop protection was \$5.9 bn

in 2000. Of this 62% was achieved from 20 active ingredients.

### New dispensing systems

Schering Plough, an animal health company, has launched two new dispensing systems designed to minimise exposure to organophosphate (OP) concentrate. This will reduce operator risk when OP sheep dipping. UK Veterinary Medicines Directorate approval for its Coopers Ectoforce sheep dip closed-transfer system has been gained by the company. The system involves water soluble packaging which is enclosed in an outer bag. The outer bag is ripped, tipping the water soluble package into the dip, with no need to measure or mix the active ingredient manually. Virbac's Gold Fleece has also been relaunched, with a new sealed dispensing system.

### Asian longhorned beetle

The Asian longhorned beetle infestations in New York and Illinois are being tackled by APHIS inspectors who are felling infested trees. To date, 7900 trees in New York and Chicago have been destroyed. Healthy trees are being injected with imidacloprid. The beetle has been detected in other counties. The infestation is believed to originate from China *via* wood packing, while other species have been identified in dwarf plant stocks.

### Resistance controlling genes

Thomas Brown and Sujin Park at Clemson University, USA, have found connections between resistance controlling genes in tobacco budworm (*Heliothis virescens*). This is a key pest targeted by both conventional insecticides, to which it has evolved resistance of all major classes, and transgenic cotton technology, for which potential resistance is a crucial issue.

The researchers have shown that there is a genetic linkage of the hscp (heliiothis sodium channel protein) gene that encodes the sodium channel target and cytochrome P450 (CYP6B10), a gene that encodes important enzymes involved in the detoxification of various pesticides. The linkage of two known resistance factors suggests the possibility of a resistance cassette in this species, which, if present, could have serious implications for management of this pest. These observations are also likely to apply to other noctuid pests including *Helicoverpa zea* (corn earworm) and *Helicoverpa armigera* (a cotton pest throughout Asia) (*Pest Management Science*, 2002, 58, 209-212).