

Unilever work with Indian gherkin growers to reduce pesticide use

Smallholders growing gherkins for Unilever's supply chains in India faced numerous pest management problems and rising pesticide costs. **Anandramiah Ramesh** describes how an IPM programme has successfully reduced pesticide use and increased yields.

Around 7,000 smallholders in the southern Indian states of Karnataka, Tamil Nadu and Andhra Pradesh have been growing gherkins under contract since the early 1990s. Unilever started sourcing these gherkins from several companies in 1993 in semi processed form and shipping them to France for bottling in their Amora and Maille brands of pickled gherkin. Smallholder gherkin growers hold around 0.25-1.0 acres of land and also grow beans, tomato and aubergines in the vegetable zones, pulses like chick pea, green gram, or cereals like finger millet, or maize, for local market or home consumption. Gherkin cultivation in India is different from other crop cultivation in that it is the only vegetable which is successfully contract farmed. However, by 1998 it was clear that yields were falling and quality was poor. In 1999, the author was appointed to put together a package of agricultural practices to help farmers improve their yields and quality.

Tackling pest problems and overuse of pesticides

Under its Sustainable Agriculture programme, Unilever has been working for over many years to improve environmental, social and economic aspects of its supply chains in many of its key commodities^{1,2}.

In India, the company has been the catalyst for bringing together farmers, extension services and universities to address pest control issues in smallholder gherkin production. It has produced a straightfor-

ward guide to the main pests, with clear photos and cultural control options explained in local languages. Technical support is provided by Field Officers working as permanent agronomist staff for Unilever Indian Suppliers with 20 to 35 agronomists for each supplier company. Each Field Officer manages around 25 farmers, visiting 15-20 acres per month and at any given time will not be responsible for more than 75 farmers or 60 acres. These officers are trained and retrained every season by Unilever Specialists and, in addition, the technical manager of Unilever visits the fields on a regular basis. Unilever controls the pesticides applied through suppliers' agronomists, who only permit application on the basis of their recommendations. Unilever suppliers provide these pesticides directly and the farmers use the pesticides on the advice of Field Officers who visit them twice a week and more frequently if required. The Field Officer is stationed at the town nearest to the cultivation area and is available to farmers by mobile phone also. Technical advice is supported by communication outreach activities, such as 'Bollywood' style films shown at village meetings, to overcome literacy constraints, and via field demonstrations. On pesticide handling, Unilever sponsored demonstration sessions in good practice in using and storing pesticides and protective clothing. Pesticide application and potential residue issues for export markets are now well understood by farmers.

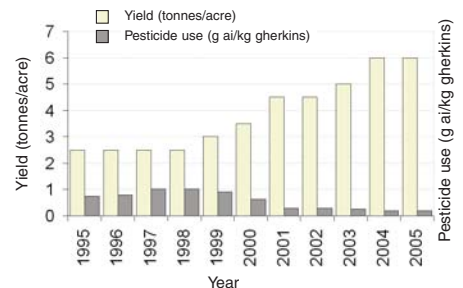


Gherkin cultivation provides an income for local farming families
Photo: Unilever



Unilever's IPM guide is a useful tool for gherkin farmers
Photo: Unilever

Figure 1. IPM has increased yields and reduced pesticide use



Successful IPM strategies

Downy mildew

One of the main IPM components has focussed on improving control of downy mildew disease, *Pseudoperonospora cubensis*. Crop rotation was introduced, along with a prohibition on growing gherkins for a period in the monsoon season when disease pressure is too high. More disease tolerant gherkin varieties have been provided and tested in local conditions and smallholders supported to improve irrigation methods to reduce the humidity around plants and therefore reducing the need for fungicides.

Melon fly

Another major pest is the melon fly, *Bactrocera cucurbitae*. The programme taught farmers to use three types of simple traps: sticky traps; pheromone traps; and home-made fruit bait traps using mashed banana and gherkin. According to the suppliers' field officers, many farmers now use the banana and gherkin bait, in addition to pheromone traps in a few regions. In some areas farmers use the pheromone trap only using four per acre once in a crop cycle. Banana bait traps may be used at the same density but the bait is replaced weekly and water added to keep the bait moist, if temperatures are very high. Development and fine-tuning of the trapping techniques were based on Unilever initiatives and teaching in collaboration with the Bangalore University of Agricultural Sciences.

Fruitborer

The fruitborer *Diaphania indica* is another



Farmers regularly monitor gherkin plants for pests
Photo: Unilever

challenging pest. The programme has introduced specific pheromone traps for this species and is supporting research work, funded by Unilever, to identify its natural enemies. This work is being carried out by Bio-Control Research Laboratories, the research and development division linked to the federal Department of Scientific and Industrial Research. To date, however, the results have not identified natural enemies which can successfully control the fruit borer.

Successes and benefits for farmers and Unilever

Pesticide reduction as a result of the IPM programme has been most successful in the case of downy mildew, for which mancozeb, metalaxyl, fosetyl aluminium and chlorothalonil fungicides were commonly used before training (see Figure 1). Overall, fungicide use has dropped by 78% since Unilever began the IPM programme. The main reason was due to adoption of better agricultural practice and proper fine tuning, such as growing in rows with channel and sub-channels for irrigation, rather than the old practice of over flooding which increased humidity and consequently the incidence of downy mildew. This was a significant cultural change which resulted not only in less fungicide use but also in savings for farmers. When downy mildew was at its peak during 1997-1999, farmers were spraying over 1.0g of active ingredient per kg of gherkins, with fungicides accounting for 20-25% of the cost of production. Currently, fungicides account for only 5% of their total costs, with perhaps another 5% for insecticides. Herbicides are not used in gherkins grown by small-scale farmers, who carry out hand or plough-driven weeding.

The IPM programme has delivered benefits for the smallholders and for the company. Since Unilever became involved directly yields have doubled and the reduction in fungicide use has been dramatic. Reductions in insecticide use have been similar but seasonal need to control sudden attacks of aphid and thrips vectors of viral disease mean that 'spikes' of increased use are sometimes unavoidable. Gherkin production is a contract crop, ensuring a guaranteed price to farmers, which helps them to stabilise their cash flow. They receive technical guidance, regular crop monitoring and work together with the agronomists to tackle problems. This collaboration has enabled the smallholders to gain access to demanding EU markets, with volumes currently increasing. In some cases, farmers are also applying IPM principles learnt in gherkin farming to their other crops. The trained farmers grow high quality competitively priced raw material and Unilever benefits by obtaining a stable supply and by developing longer-term partnerships with suppliers and their growers (they have a 10% turnover rate of farmers compared to the normal 70%).

Several lessons can be drawn from the

Germany bans bee-killing pesticides

Germany has banned a family of pesticides after millions of honeybees died in the Southwest of the country. Beekeepers in the region reported mass bee deaths earlier this month following the application of a pesticide called clothianidin.

'It's a real bee emergency,' said Manfred Hederer, president of the German Professional Beekeepers' Association. '50-60% of the bees have died on average and some beekeepers have lost all their hives.'

Tests on dead bees showed that 29 out of 30 examined had a build-up of clothianidin. The chemical, produced by Bayer CropScience, is sold in Europe under the trade name Poncho. It was applied to the seeds of sweetcorn planted along the Rhine this spring. The seeds are treated before planting or are sprayed while in the field.

Clothianidin is one a group of pesticides, the neonicotinoids, all of which have been temporarily suspended in Germany. It is a systemic chemical that attack the nervous system of insects and according to the US Environmental Protection Agency it is highly toxic to honeybees.

The German Federal Office of Consumer Protection and Food Safety has suspended the registration for eight pesticide seed treatment products used in rapeseed oil and sweetcorn, all of which contain neonicotinoid pesticides. The suspended products are: Antarc (ingredient: imidacloprid; manufacturer: Bayer), Chinook (imidacloprid; Bayer), Cruiser (thiamethoxam; Syngenta), Elado (clothianidin; Bayer), Faibel (imidacloprid; Bayer), Mesurool (methiocarb; Bayer) and Poncho (clothianidin; Bayer).

Bayer says the seed company failed to use the glue-like substance that sticks the pesticide to the seed, allowing the chemical to get into the air.

This is not the first time that Bayer, one of the world's leading pesticide manufacturers with sales of €5.8bn (£4.6bn) in 2007, has been blamed for killing honeybees. In the United States, a group of beekeepers from North Dakota is taking the company to court

after losing thousands of honeybee colonies in 1995, during a period when oilseed rape in the area was treated with imidacloprid, another neonicotinoid.

Bayer's best selling pesticide, imidacloprid, sold under the name Gaucho in France, has been banned as a seed dressing for sunflowers in France since 1999, after a third of French honeybees died following its widespread use. Five years later it was also banned as a sweetcorn treatment. A few months ago, the company's application for clothianidin was rejected by French authorities.

Last year, Germany's Green MEP, Hiltrud Breyer, tabled an emergency motion calling for this family of pesticides to be banned across Europe while their role in killing honeybees was thoroughly investigated. Her action follows calls for a ban from beekeeping associations and environmental organisations across Europe.

The *Coalition against Bayer-dangers* has demanded that the pesticide maker withdraw all neonicotinoids from the market worldwide. 'We have been pointing on the risks of neonicotinoids such as imidacloprid and clothianidin for almost 10 years now,' Philipp Mimkes, spokesman for the *Coalition against Bayer-dangers* said. He added that with an annual turn-over of nearly \$1.25 billion that imidacloprid and clothianidin are Bayer's most important products.

The Baden Apiarists' Association, with 7,100 members, said it would study a compensation claim against farmers or the pesticide makers and would meet with the state agriculture minister, Peter Hauk.

'The beekeepers have come to a point where they have to deal with securing their existence,' said Ekkehard Huelsmann, chairman of the Apiarists' Association.

1. *Pesticides: Germany bans chemicals linked to honeybee devastation*, Alison Benjamin, *The Guardian*, 23 May 2008.

2. *Germany Suspends Pesticide Approvals After Mass Death Of Bees*, Nidhi Sharma - *AHN News Writer*, 22 May 2008.

3. *DW staff / DPA* <http://www.dw-world.de/dw/article/0,2144,3343248,00.html>

gherkin experience:

- Pesticide use reduction is only achieved through taking a whole cropping system approach, covering cultural practices, water, soil and plant nutrition, as well as pest management.
- Training helps farmers understand better and comply with EU pesticide and MRL legislation, although issues may still arise.
- Developing new, non-chemical pest management methods is a continual challenge and takes time and resources.
- There is pressure coming from customers on food miles and carbon footprints.

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3. Smith G, 2008. *Developing sustainable food supply chains. Philosophical Transactions of the Royal Society B* 363, 849-861.

4. *Unilever Sustainable Agriculture programme website* <http://www.growingforthefuture.com>

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