

Volume 21 - Issue 22, Oct.
23 - Nov. 05, 2004

India's National Magazine
from the publishers of THE
HINDU

Frontline

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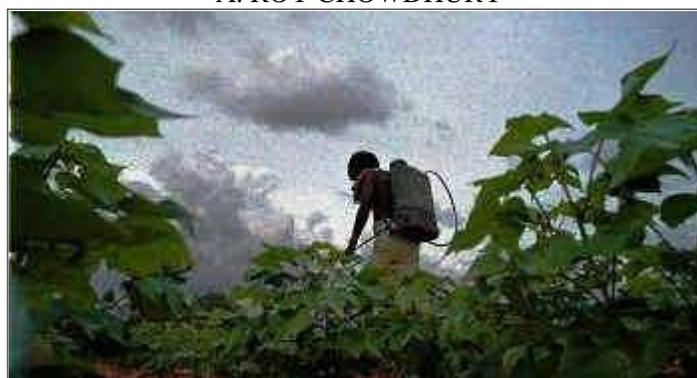
Detoxifying the villages

JAYATI GHOSH

In an agriculture ravaged by the aggressive penetration of commercial inputs with often dubious side-effects, a group of villages in Andhra Pradesh presents an alternative.

A GROUP of villages in rural Andhra Pradesh shows how natural integrated pest management can transform cultivation in a painless way.

A. ROY CHOWDHURY



A farmer spraying pesticides in Mehboobnagar district of Andhra Pradesh.

We had barely sat back to listen to the experience, when the next two groups of inquisitive travellers arrived. One vanload was from a neighbouring mandal of Khammam district; another bus full of people came all the way from Warangal. Shri Hemla Nayak, secretary of the watershed committee of the village, smiled ruefully at us. He would now have to start telling his story all over again.

But then, he has grown used to it. In the past months, the once sleepy and unexceptional village of Pulukula, in Palvancha mandal of Khammam district in Andhra Pradesh, has become a pilgrimage site of sorts for all those interested in seeing first-hand how natural methods of integrated pest management work in practice. Shri Nayak now has to repeat his story at least four times a day to new visitors; he says he has hardly any time left for

farming.

This is a small price to pay for what appears to be one of the most successful attempts at using traditional farming methods effectively and cheaply, and for the immense good work of spreading this message to other cultivators. The Agriculture Minister of Andhra Pradesh has already expressed interest in extending this experience to other areas, which is another positive sign.

In Andhra Pradesh, costs of cultivation for most crops are among the highest in India, and one important reason for this is the high dependence in the region on pesticides to control pests that routinely attack cash crops such as cotton, chillies, tobacco and groundnut. The high cost of inputs, as well as the proliferation of spurious seeds and pesticides, have directly and indirectly contributed to growing distress among cultivators, which has in turn led to the increasing incidence of farmers' suicides.

Cotton cultivation was learned in this area in the early 1980s from the farmers who had migrated from Guntur district, where heavy pesticide use is even more widespread. The same pesticide companies who served the Guntur region also made their way here, in the same way that they have spread across the State. The dealers in pesticides also supply seeds and fertilizers to the farmers, often on credit at interest rates ranging from 2 to 4 per cent a month.

Chemical pesticide prices are very high - in Pulukula, for example, the farmers tell us they used to spend around Rs.6,000 for pesticides per acre of cotton cultivation every crop season. Further, the pesticides became less effective over time as pests quickly developed resistance to them, and newer, more expensive varieties had constantly to be introduced. Avant and Tracer are the brands currently popular across rural Andhra Pradesh, but pests are already developing resistance to them in several areas.

In addition to the costs and lack of effectiveness, there are serious health risks associated with the use of pesticides, which are after all essentially concentrated poisons. Those spraying the pesticides frequently fell sick, from the knock-on effects and from the spillages that came from carrying the containers on their shoulders. Women who mixed the solution suffered from nausea, vomiting and headaches. Poor eyesight and itching were frequently reported, and in extreme cases - which occurred at least once a season - people died from excessive exposure. There was a thriving business for autorickshaws, transporting sick people to the hospital in nearby Kothagudem.

The heavy use of pesticides on the cotton crop even affected the market for the output - farmers found that they were getting lower prices because the traders claimed that the garments made from their cotton caused itching and discomfort on the hands and body.

Despite all these problems, farmers persisted with the use of pesticides because of the insecurity about pest infestations affecting crop output, and there was even competitive pressure to use more and more on their own

fields if their neighbours were doing so.

SHRI NAYAK describes how K. Venumadhav, who was associated with SECURE, a non-governmental organisation that ran the watershed project in the area, noticed these adverse health effects and suggested that the villagers try more natural alternatives. At first, he was greeted with cynicism from the villagers, who felt that they had heard all this before many times from the usual do-gooders who come to rural areas mainly to benefit themselves. But he persisted and engaged some local youth and women to collect neem seeds, so as to demonstrate on one field how pests could be controlled by natural methods.

When they saw the beneficial effects on both costs and output, the local farmers were convinced, and started adopting the same practices. Other NGOs such as Centre for Sustainable Agriculture moved in with an integrated programme using locally available materials; and the programme expanded, from about 20 farmers to the entire village the following year. Now a group of five neighbouring villages are all using the same methods, and the over 200 peasant households in this area have completely avoided buying any pesticides for the last three years.

The cost reductions and other benefits have been dramatic. From about Rs.6,000 an acre, the costs of the natural pesticides (not counting the costs of household labour used in preparation) amount to no more than Rs.300-400 an acre of cotton cultivation. The human and animal health problems associated with pesticide use have disappeared. Remarkably, even the yields have improved - on rain-fed plots the yields have increased from 5 quintals a hectare to 8 quintals; on irrigated plots from 8 quintals to 12 or as much as 15 quintals. Certainly, the fields in October showed a lush and healthy crop, which also reflected the good quality of the soil in the area.

How difficult is the new system of natural integrated pest management that the villagers are practising? Their own description makes it sound relatively easy, and certainly something that can be implemented without much difficulty in many other places. It consists of a range of techniques applied successively to different stages of the crop. While the dominant crop here is cotton, the villagers have already extended this system to other crops such as chillies, red gram, vegetables and paddy, with minor variations.

In the case of cotton, the first step is some intercropping - to ensure the planting of some "trap crops" that attracts pests. These (such as castor and chrysanthemum) attract pests that settle on the leaves, which can then be removed and discarded during the egg-laying period of the pests. The villagers also place some tree branches with small containers of water to attract birds who then rest there, and eat the pests and their larvae.

The purpose is to encourage the presence of "beneficial" insects and birds which eat the harmful ones and therefore exert a natural control on undesirable pests. Of course, this is a more labour-intensive process, requiring frequent checking of fields, but where rural underemployment is so high, that is not really an issue. In any case, the villagers point out that

they are saving a lot of time by not going to the pesticide shop.

When the cotton crop is young, it attracts white flies and sucking pests, which generate leaf curl disease. For these pests, a neem extract is sprayed on the crops. This is prepared by the villagers themselves (who now have their own grinding machine purchased by a local women's Self Help Group). The neem seeds are collected in summer, soaked in water to allow them to expand and then dried. Then the seeds are ground into powder, mixed with water and a small quantity of detergent. Two sprayings are usually required.

Since this spray tends to make the leaves brittle and affects flowering, this is counteracted by a subsequent spray of a combination of fermented cow dung and urine, to which a small quantity of lime is added. This ensures good flowering, which in turn attracts new pests such as the infamous bollworm, for which the genetically modified BT cottonseed was developed. To guard against this, a new concoction is prepared - this time of a large quantity of chillies, a smaller amount of garlic that are ground together and mixed with some kerosene. This spray has been found effective in controlling bollworm.

Another black variety of bollworm - a nocturnal pest called *spodoptera* which comes in the last phases of the cotton crop - is dealt with by placing little balls of rice bran and jaggery in the fields. The pests die on eating this. Finally, the jassids who also come in the last phase are attracted to small sheets of iron smeared with grease, placed in the fields. The insects get stuck to it at night, and can be cleaned out in the morning. In the fields we visited, cheerful bright yellow squares could be seen dotting the fields of rich crop.

Because of the increasing use of this method, local production of these natural inputs has already proved to be insufficient, and the local people are already purchasing neem seeds. Despite this, the money outlays on these are unbelievably low compared to the chemical pesticides in the market, and the system is apparently more effective in controlling pests and ensuring a healthy and non-toxic crop.

Of course, some people are not happy about this - particularly the pesticide companies. In the village bus stop, we saw how the detailed instructions that had been provided on the new pest management method had been completely covered up by pesticide advertisements. The companies are already aggressively campaigning against this natural system.

Despite this, the benefits are so self-evident that it is not surprising that word is spreading rapidly across rural areas and so many people are flocking here to learn about this method. In an agriculture ravaged by the aggressive penetration of commercial inputs with often dubious effects, this represents not only an important alternative but perhaps a major way forward in redirecting cultivation practices. This little village may be showing a way forward not only for other farmers in Andhra Pradesh, but for the whole country.

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