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# Fighting pests without pesticides

## Guest Column



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In the Mahabharata, there is a telling story of the valiant Abhimanyu, who died fighting while trying to come out of the 'chakravyuh' (seven-layered battle formation). In a lot many ways, the Indian farmer is like Abhimanyu. He has been pushed deeper and deeper into the 'chakravyuh' by a profiteering agro-chemical industry and an insensitive scientific community, but does not know how to escape from it.

In a country where more than 2.9 lakh farmers committed suicide between 1995 and 2011, the farmer faces a Hobson's choice. He knows that sooner or later he, too, will become a victim of the serial death dance being enacted on the farm or will be forced to quit agriculture.

Much of the destruction that we see on the farm is the result of unwanted and exorbitantly expensive chemical inputs. Take the case of chemical pesticides. It was in the late 1970s that David Pimental of Cornell University (US) had

said in his landmark paper that 99.9% chemical pesticides go into environment and only 0.01% of the pesticides sprayed reach the target pest. Despite this warning, agricultural scientists continued to advocate the use of chemical pesticides. While the industry gained immensely, farmers as well as gullible consumers suffered.

In search of viable alternatives, I visited Nidana and Lalit Khara, two tiny, nondescript villages in Jind district of Haryana. Farmers and women in these villages don't spray chemical pesticides on cotton. Going a step ahead, they don't even use bio-pesticides. They have allowed the insect equilibrium to prevail to such an extent that the harmful insects are taken care of by the beneficial insects.

The amazing story of Nidana has to be told. For some illiterate and semi-literate women, and some enterprising farmers around Nidana village, the mealy bug poses no threat. The mealy bug is a sucking pest and is known to devour crops at will. The mere presence of the insect in the cotton fields sends a chill down the spine of farmers.

Meena Malik is a 23-year-old graduate who, along with some 30 women of nearby villages, partakes in a mahila keet pathshala (women's insect school) every week. She told me: "We have been able to identify 109 non-vegetarian insects (beneficial) and 43 vegetarian (harmful) insects in our cotton fields."

An elderly woman, Santosh Malik, said: "Mealy bugs are controlled by 16 kinds of beetles, six kinds of bugs, seven kinds of flies and insects like praying mantis and chrysopa." She brought some beetles and bugs for me to see. Explaining to me how the insects adopt different mechanisms to kill, she told me how three insects - angira, fangira and jangira - would lay eggs in the stomach of the mealy bug. One egg is laid per mealy bug. This eats up the stomach of the mealy bug, which turns red and eventually dies.

Among the bugs that feed on the mealy bug are kala baniya, lal baniya and matlu baniya. The bugs, very small in size, are literally bloodsuckers. Adults as well as the larvae of the lady beetle feed on the crawlers (children) of the mealy

bug. In its life cycle of 30-35 days, each mealy bug lays on an average 400 eggs, which becomes a rich source of food for the lady beetle and its offspring.

The most dreaded pest attacking cotton is the American bollworm, which survives on some 90 plant species. Dr Surinder Dalal, agricultural development officer of the Haryana agriculture department, who is considered to be the moving spirit behind this remarkable initiative in preserving insect equilibrium, said: "Moths of the bollworm lay on an average 700 to 3,000 eggs on different plant leaves. According to Kuldeep Singh Dhanda, pradhan of Brah Kalan Bahra village in Jind district, "The beetles eat the eggs, and nine kinds of bugs - two of which are locally called katil burga, didar burga - suck the eggs. The moths are eaten by the robber fly and the dragon fly."

The Nidana experiment began in 2007. It wasn't easy to convince cotton farmers that they could do without chemical and biological pesticides. But with each passing year, more and more farmers are becoming aware of the ecological pathway. To me, the Nidana experiment is the way out of the 'chakravyuh'.

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**FARMERS AND WOMEN IN TWO VILLAGES OF HARYANA'S JIND DISTRICT DON'T SPRAY CHEMICAL PESTICIDES ON COTTON. GOING A STEP AHEAD, THEY DON'T EVEN USE BIO-PESTICIDES**