

# **Report and Recommendations of the Jury on the Nidana model of Biological control of Pests**



***February 20, 2015***

**Shri R.S.Dalal**

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**Justice (retd.) S.N.Aggarwal**



## THE REPORT OF THE NIDANA JURY

Mr Devinder Sharma was already aware of the problems being faced by farmers in spraying chemical pesticides as he had already visited villages *Nidana* and *Lalit Khera* to study about their problems.

Shri Kuldip Singh Dhanda convenor of the *Sarvajatiya Sarvakhap Panchayat* Haryana contacted Mr Devinder Sharma and sought his help to make the farmers aware about the damage being done to the environment, human health and the crops from chemical pesticides. Sh. Dhanda told that they wanted to hold a *mahapanchayat* in which farmers from 18 villages will gather, and they wanted help to spread this message of village *Nidana* and that it be conveyed to the higher government authorities to help them spread this message. For this, his idea was to constitute a three-member jury on Feb 20, 2015, in *Nidana*.

They formed a jury consisting of:

1. Justice (retd) S N Aggarwal, former judge of the Punjab & Haryana High Court, Chandigarh.
2. Devinder Sharma, Food and trade policy analyst.
3. R S Dalal, member secretary, Haryana Farmers Commission.

Sh. Sharma conveyed this message to the proposed Chairman Justice Aggarwal, and also to Sh. R S Dalal. They agreed to be member of the jury for such a noble cause.

Accordingly, we reached the venue in village *Nidana* in *Jind* district on 20 February 2015 at 11 am. The *mahapanchayat* was held in Daffodil High School. There was a lot of gathering. Farmers and farm women from different villages were present. Also present were chiefs of some 20 *Khap panchayats* on the stage, including Dr. Santosh Dahiya, president of the *mahila* wing of the *Khap panchayats* in Haryana.

Mr Dhandha conducted the proceedings. He invited some farmers and farm women as representatives of the insects – both benign (non-vegetarian) and harmful (vegetarian insects). In addition, a presentation was also made by a group



of farmers on behalf of the farming community and also a group of children who spoke of the GenNext.

**Group 1 – representative of non-vegetarian insects:**

Virtually this group complained to the jury as to why they were being killed by farmers by spraying pesticides when they were causing no harm to the crops rather they were helping the farmers by eating the harmful insects which cause damage to standing crops. These insects do not cause any damage to the crops but instead eat those insects which feed on the crops.

Presentations were made on behalf of Beetle, *Hathjora*, *Bugre*, Flies and *Parpetiye* insects. From their presentations the jury learnt that there are many types of benign insects in a crop field which were identified and named (in local language) by the late Dr. Surender Dalal, who had initially identified and researched on the different roles of different insects. He had indentified 161 kinds of non-vegetarian insects (benign insects) and 43 kinds of vegetarian insects (harmful insects). He had educated the villagers through *Mahila Keet Pathshalas*. As a result of this exercise, the women in these villages have allowed the insect equilibrium to prevail to such an extent that the harmful insects are taken care of by the beneficial insects.



*Parpetiya*

The women group which spoke on behalf of Beetle insects presented their complaint. They said that beetles from birth are non-vegetarian. They don't even know the taste of leaves, flower or fruits since they feed only on insects. But they were being killed when farmers spray the crops in the mistaken belief that all insects are harmful. They eat the eggs and also the harmful insects like white fly, aphid, *churara*, mealybug and others.

Among the lady beetles, both the adults as well as the larvae, feed on the crawlers (children) of the mealy bug on priority basis. In its life cycle of 30-35 days, each mealy bug lays on an average 400 eggs, which becomes a rich food source for the lady beetles and their offspring.



*Dasayu Bugra*

Such is the importance of lady beetle insects that the women have prepared a *Haryanvi* folk song highlighting the virtues of the insect. If we understood properly, the lyrics of the folk song do plead for the lady beetles to come and save the cotton crop which has been destroyed by pests.



*Matku Bugra*

The most dreaded pest on cotton is the American bollworm (locally called American *sundi*), which is polyphagous in nature surviving on some 90 plant species. The moths of the bollworm lay on an average anything between 700 to 3000 eggs on different plant leaves. Kuldeep Singh Dhanda told us "The beetles eat the eggs, and 9 different kinds of bugs -- two of which are locally called *katil bugra*, *didar bugra* -- suck the eggs, and the moths are eaten by robber fly and dragon fly." Together they control the American bollworm.



*Balonwalilal Sundi*



*Kubda Kida*

There is another non-vegetarian insect locally called *Hathjora* which delivers 500-600 eggs, and each egg requires about 10 'subdies' which means a total of 5000-6000 worms are eaten by *Hathjora*.



*Hathjora*

'Bugre' was represented by a farmers group from Lalit Khera village. They can identify 7 different kinds of 'bugre'. The 'bugre' breeds are basically blood suckers. They thrive on sucking blood of all kinds of insects. Even the young of the 'bugre' live on the blood of others. 'Parpetiye' is of 14 kinds. They are popularly called angira, jangira and bangira, and give eggs in the stomach of mealy bug, a serious pest of cotton. Mealy bugs are controlled by 16 kinds of beetles, 6 kinds of bugs, 7 kinds of flies and insects like *praying mantis* and *chrysopa*.

Explaining how different insects adopt different mechanisms to kill, they told us how an insect called *angira*, black in colour, would lay eggs in the stomach of the mealy bug. One egg per mealy bug. This eats up the stomach of the mealy bug which turns red in colour and eventually dies. Besides *angira*, she named two other insects of the same kind -- *fangira* and *jangira*

## **Group 2 – Harmful vegetarian insects**

The next group which made the presentation was on behalf of the vegetarian insects which feed on leaves, flowers and fruits. Their complaint was that they were not causing any big damage to crops.

The 'rachusak' group says they only take surplus juice of the leaves and therefore are not harmful. Accordingly, plant makes 4.5 gms of biomass every day of which 1.5 gms for roots, 1.5 for the growth of the upper part, and the remaining 1.5 gms is surplus which is what 'raschusak' feeds on. They said it is primarily the 'raschusak' remains with the Economic Threshold Level (ETL) prescribed by scientists but it is only because of insecticides sprays that the insects balance is disrupted as a result of which their number grows.





*Churha*



*Chepa*

The 'parnbhakshi' group of insects feed on the leaves of the plant. This insect only creates a small hole in the leaves, about 5 per cent (and does not eat the entire leaf). This helps the sunlight to pass through for the photosynthesis development of the lower leaves. 'Phulahari' insects as the name suggest feeds on the flowers. Their complain was they do feed on the flowers; eat the petals and this helps in the pollens getting onto their backs. They fly to other plants and shed the pollen which helps in natural crossing between the plants. They said if they did not exist, many of the plant species would not have been able to regenerate.



*White Fly*



Fruit eating insects are 'Falahari'. They have a role in maintaining the balance of plant's growth by eating the fruits. By spray of pesticides the non-vegetarian insects get killed as a result of which their number grows. So it is not their fault but the excessive use of chemical pesticides. This group also shared the story of 2001 cotton debacle when farmers sprayed 30-35 times on cotton crop thereby killing all non-vegetarian insects.

### **Group 3 – Farmers**

An interesting argument came from these farmers (who represented the farmers as a community). Their main grouse was that they had been pushed into the vicious circle (*chakravayuh*) by pesticides companies who have advised them to spray pesticides failing which their crops would be destroyed by insects. They expressed their helplessness saying that they only followed what was advised to them. They are unable to come out of the *chakravayuh* for want of proper advice. They have also unlearned the farming practices which relied on using good insects to control the bad pests. Government agencies have failed to educate them on safer alternatives as a result of which they continue to spray.

Farmers said they are at loss because of the use and abuse of pesticides. Sometimes they die or suffer health consequences while spraying potent chemicals in the fields. Many times the crops also fail despite massive use of pesticides like cotton in 2001 and between 2004 and 2006. The cost of production goes up phenomenally as a result of which farmer slips under debt forcing many of them to commit suicide. They also expressed their pain at the consumers blaming them for supplying poisonous foods and vegetables. Many health problems emanate from the application of pesticides. The chemicals are also responsible for contaminating the ground water, and the environment.

They admitted that pesticides cause damage to environment and human health. They blamed not only the government agencies but also the educated classes/agricultural scientists for not imparting proper knowledge and advice on whether they should or should not use pesticides.

#### **Group 4 – Children (representing the future generation)**

The children narrated their concern for the future generations. They said as representatives of the future generation they are not asking for big houses or big cars but only demand clean environment. They asked the elders to leave behind a safe planet just like their forefathers had left it for them. They also presented that if their parents suffer the consequences of pesticides applications like cancer, kidney failure and heart attacks even then they suffer and otherwise also their own future is at dark.

### **RECCOMENDATIONS OF THE NIDANA JURY**

#### **Knowledge spread by Dr. Surinder Dalal about friendly and harmful insects**

It was a unique experience to be a jury in such a function in which we were told that even the insects are of two kinds, one friendly to the crops and the other which was harmful. The creator of such information in this area was Dr. Surinder Dalal, who himself is no more now, but who had taught a number of persons during his life time to distinguish between the two category of insects. Even the female villagers of this area could identify the insects which are friendly and which are harmful for our crops. About 183 persons of these villages were fully trained to identify the insects.

In support of their representations we were taken to the adjoining fields. We were shown some plants of *sarson* crop and some insects were seen by us sitting on the leaves. We were told that those insects were harmful to the crops. Some insects were in the egg stage and some were in their old age. Later on we were also shown an insect which was friendly to the crops because that insect belonged to that category of insects which eat the harmful insects. By spraying the pesticides both category of insects get killed. The use of pesticides does not improve the quantity or quality of the crops but has very bad effects which are discussed below.

### **These villages do not spray the pesticides-crops still better**

We were also told that in that area the pesticides were not being used after they learnt that by spraying pesticides they were even destroying friendly category of insects which eat harmful insects and thereby save our crops from being damaged by the harmful insects. We were also told that the crop yield in their area is no less than in the area where the pesticides were being used. Rather the crop production is more in their fields and better in quality.

### **Pesticide manufacturing companies/dealers misguide the farmers- harmful effects are not told**

There is no denying the fact that the pesticides are the poison in various forms. The companies which manufacture such poisonous pesticides wrongly advise the farmers to spray the pesticide on their crops to save their crops from the insects and to get more yields. These companies are interested to sell their pesticides. They are least concerned if the friendly insects are also killed by the use of the pesticide or if the vegetables get affected by the spray of pesticides or that the health of the consumer of that vegetable is adversely affected by various diseases by the consumption of that vegetable on which the pesticide has been sprayed.

### **Farmers are innocent and have no knowledge about the insects-effect of spray of pesticides-go by the ill-advice of companies**

The farmer in order to get more yields and having no knowledge of various kinds of insects, in his innocence accepts the ill-advice of the companies or their dealers and uses the pesticides. With the wrong advice given by the companies producing pesticides and their dealers or with an anxiety to get more produce by getting rid of the insects, the poor and innocent farmer purchases the pesticides and sprays the same frequently at different stages of the growth of the crop.



### **Sometimes farmers die while spraying pesticides**

Sometimes farmers die while spraying the pesticide which has strong quantity of poison as the poisonous effect spreads in the air and when the farmer inhales, it enters his body and affects him adversely, even proving fatal sometimes.

### **Cost of production goes up by spray of pesticides frequently-income remains the same-farmer becomes a debtor-commit suicide**

Since the pesticides are sprayed frequently under the misconception. As a result the cost of production goes up. With the yield remaining the same, consequently the income remains the same. The amount of debt goes up by the purchase of pesticides, which the farmer fails to repay, the consequences are obvious. It creates a situation where in the farmer finds no escape route and the tendency to commit suicide goes up in the farmer and he is driven by the circumstances to do the same.

### **Farmer and his family is doomed- a farmer who employs labourer-children become labourers-sometimes children become drug-addict**

The family of the farmer is doomed. Sometimes the family has to sell the land in order to save its prestige in the society. It blocks the future sources of income for the family and the future of the children of the farmer family becomes bleak. A family of farmers who was once rich and used to employ labourers, the children of that family now had to work as labourers in order to survive. Sometimes it also becomes the reason why the children of the farmer family have to drop their studies in order to support their families. The children sometimes fall in the wrong company and become addicted to drugs. This way also the family loses everything. The wrong advice of the pesticide producing companies and their dealers out of their own greed and innocent and not properly educated farmer falls in their traps and it leaves the family of the farmer in hell-like conditions.

### **By frequent spray-crops become costly-whole society suffers**

Since the cost of production goes up by the frequent use of pesticides on the crops, these are sold at higher price. As a result the budget of the consumers of these crops or vegetables is imbalanced as they have to spend more not planned earlier. The food items, vegetables, and fruits become costly. The cotton crop which is the raw source of clothes makes clothes costlier and the consumers of the cloth have to spend more than earlier. Therefore the frequent use of pesticides leaves a chain of consequences which affects the whole society.

### **The poisonous effect of pesticides sprayed on vegetables/eatables- generates diseases-cancer- kidney failure etc.**

Leaving aside the farmers' life which is badly affected by the frequent use of pesticides and the other economic factors by which the life of the whole society is affected by it, as explained above, it has deeper consequences which affects our lives and darkens the future of the coming generations. After these pesticides are sprayed in the fields, the insects get killed but the bad effect of pesticides is also left on the produce. The poison of the pesticides passes on to the vegetables and the other eatables. Repeated use of pesticide by the farmers all around and on almost all the crops and vegetables, badly affects the body of the consumers. As a result a number of diseases is generated by the consumption of these vegetables and crops. It is for this reason that diseases like cancer grips a large number of persons. The other serious diseases like kidney failure etc are becoming more common which were not heard about 40/50 years earlier.

### **Ground-water becomes poisonous-becomes source of diseases**

Not only the crops are affected by the frequent use of pesticides, but even the land where it is sprayed is affected by the poisonous effect of the pesticides. Slowly and gradually its effect goes deeper and deeper and ultimately it travels on to the ground water and since pesticides are being sprayed by the farmers

indiscriminately on almost all the crops for the last so many years, the alarming situation has developed.

### **Frequent use of pesticides pollutes the air**

Otherwise also the poisonous effect of the pesticide goes viral into the air and pollutes the environment. It becomes highly unhealthy all around and generates various diseases. Therefore the spray of pesticides spreads poison all around, on the ground, in the air and in the underground water.

### **Pesticides even make the green fodder/grass poisonous-affects animals-their milk**

The pesticide when sprayed leaves its poisonous effect on the green fodder which the cattle consume. As a result the poisonous effect of the pesticides passes on to the body of the cattle and the milk yielded by these buffaloes and the cows is also affected.

### **Situation has become alarming-credit goes to late Dr. Surinder Dalal to spread awareness**

The situation has become very alarming. Time has come when we should stop using the pesticides which is affecting the human life very adversely particularly when the use of pesticide does not help in the increase of the crop yield. Hats-off to late Dr. Surinder Dalal, who by his hard work left behind a store of knowledge which teaches us how to identify the good from the bad insects. The question now is how to educate our farmers about it.

**Government's duty-Farmers need to be educated about insects-bad affect of pesticides-183 person taught by Dr. Surinder Dalal can become change agents to spread awareness-save the environment-future of young generations.**



### **Incentives by Government for pesticide free cultivation of crops**

Government may intervene by encouraging such people who do not use the pesticides or by giving incentive to the villages, the residents of which do not use the pesticides can set examples before other villages and the residents of those villages. For educating the farmers of other villages the government can utilize the services of 183 residents who are fully conversant, courtesy late Dr. Surinder Dalal, about the friendly and harmful insects. The Government may frame a special scheme for this purpose. **The government can also give awards in the name of Dr. Surinder Dalal to those villages or the residents as the government plans to encourage the non-use of the pesticides.** It will not only improve the lives of the farmers but help the consumers also and the society as a whole. It will save the environment and ground water from the poisonous effect and will help to leave the earth clean for the future generation.

### **Ban be imposed on Pesticide producing companies/ dealers**

The government can also impose restriction on the sale of pesticides and discourage the pesticide producing companies by banning their entry in the State. But educating the farmers that they can get better crops even without using the pesticides is more important and deserves priority.

### **Research in Universities- National Centre for Integrated Pest Management, New Delhi**

The analysis regarding the friendly and harmful insects conducted by the farmers of village Nidana should also to be recommended to the Universities for undertaking a research in their own laboratories to further strengthen the view that pesticide kills the friendly insects also, which are otherwise not harmful to the crop. The members of the jury were happy to know that the National Centre for Integrated Pest Management, New Delhi has also undertaken research to verify the claims of the farmers.

**Conclusion :**

The Jury feels that the representations made before them by the various groups on 20th February in village NIDANA district JIND was a unique learning for them and recommends that the Knowledge left by Dr. Surinder Dalal must be imparted to the farmers without delay so that the usages of pesticides is stopped at the earliest in the interest of the State as a whole. By doing so, with little expenditure, the State would take a revolutionary step which will bring laurels to the State in whole of the country.

**Shri R.S.Dalal****Shri Devinder Sharma****Justice (retd.) S.N.Aggarwal**





