

**Sun Jing, Mao Zhong-shun. Experience Share of Farmer Training: Reduction of Pesticide Use in Community In Yunnan. SAFE Danida Reginal Workshop on Sustainable Agriculture, 2006:170-174**

**Experience Share of Farmer Training  
Reduction of Pesticide Use in Community in Yunnan**

*by Sun Jing/ Mao Zhongshun, Pesticide Eco-Alternatives Center Yunnan, P.R.China*

**Abstract:**

*Ecological agriculture is regarded as an important agriculture development type in the world. Characterized with the use of traditional techniques of pest control and the use of organic matter to the soil fertilization making the ecological agricultural a sustainable agriculture. However pesticide is one of the biggest obstacles to develop ecological agriculture. Overuse and abuse of pesticide, even high toxic pesticide, such as methamidophos, is very popular in the rural community. Farmers are willing to develop ecological agriculture but they could not give up the uses of pesticide. A series of actions have been done to eliminate the use of high toxic pesticide and reduce the low toxic pesticide use as well. Firstly, the status of the pests and pesticides use were surveyed; Secondly, the risks to the health of human and stockings and herds and the environment brought by the use of pesticide was told to the farmers and the community pesticide monitoring groups were set up simultaneously; Thirdly, the monitoring information was collected, then, some serious situation and cases might be found, because of the use of high toxic pesticides, all of this information will be shared with farmers. Farmer's awareness of environment and health was built up through the training system. A lot of the farmers gave up the use of high toxic pesticide in the control of pests. An important law is summarized that in the farmer training a good trainer is not a trainer but a good promoter of the awareness of the farmer.*

**Key words:** *farmer training, community, pesticide, reduce*

Pesticides are chemicals that can kill pests, such as fungi, insects, weeds, rats, or regulate the growth of plants. However pesticides are toxic. Different pesticides have different toxicity. Because of different education background people have different comprehension of pesticides. People in the cities or towns on low land know more about pesticide than those in the mountain area. Farmers in the mountain area use pesticides to control pests without any concern about their toxicity. Pingzhang is mountainous village in the city Baoshan in Yunnan province. Farmers in the village use a lot of pesticides, including high toxic pesticide to control pests. The high toxic chemicals serious frighten the survival of some insects, aquatic organisms and the health of the natives. In order to reduce the use of pesticides in the village and empower farmers' comprehension of pesticides we conducted a series of trainings. The achievements were obtained after the trainings based on the information collection before training scheme was



being worked out. An important law is summarized that in the farmer training a good trainer is not a trainer but a good promoter of the awareness of the farmers.

## **1. Information collection of the project site**

Before the practice of the training we have collected some information, including natural environment, administration, farming and animal husbandry, of the project site Pingzhang village, which locates in the Northwest of Baoshan city, a city in the west of Yunnan. Pingzhang village is a small village in the Gaoligongshang mountain national natural reserve of China. There are five small villages, which are Dazhai, Pingzhang, Xinzhaizi, Lujidi and Baishuihe village, under the administration of the Pingzhang village. The total population of the village is 1573, a lot of them are Yi nationality. Because the village base is in the mountainside so the water source is seriously deficient.

Crops, such as rice, corn, wheat and fababean are grown in this village and the average yield is very low, the yield of the some crop is as low as 30 kilograms per mu (1 mu equals 666.67 m<sup>2</sup>). Currently under the support and funding of ICRAF (international center for research of agroforestry) more than 1700 mu walnut were planted in this village. Animal husbandry is one of the main economic source of the villagers, 620 pigs, 64 goats and 628 stocks were sold at the end of last year. The average income of the villagers is 579 *yuan* last year, in the total gross farming, stock breeding, forestry accounts for 47.7%, 41.7%, 4.3% respectively.

From 1980s the villagers began to use pesticide to control the pests and diseases and their expenditure was around 100 *yuan* per year. Now all of them have the idea of using pesticides to control pests and diseases, however they have no the knowledge of pests and diseases not alone the knowledge of pesticides and the risks and hazards that bring by the pesticides and the packages of the pesticides. During our survey in the village this February we saw a lot of farmers store their pesticides just under the dinner table or in the kitchen. And discarded pesticides packages were here and there, near the streams, in the field, and some were in the compost.

Farmers have the idea to control pests and diseases but they don't know how to make a best and effective pesticide solution. They just put one third or one fourth of the pesticide into the sprayer then add water. That is to say that farmers are using excessive pesticide in the control of pests, which is the need or will of the pesticide manufacturers and retailers. Farmers use a lot of pesticides one time and they use up soon then come to the market to purchase again. Manufacturers and retailers will earn a lot money with the rapid recycle, so they wish the farmers use excessive pesticides one time.

Farmers don't have the awareness to protect themselves in the spraying of pesticide and pollute the environment after spraying. They usually spray without masks, gloves and exposure suit so that their faces, hands and body expose to the pesticide. In the interview with the farmers some women said that they skin feel itching after spraying. However that is what people can feel but the most dangerous is what they can not see and feel, such as the freaks led by the long-term pesticide spray of women. After spraying they throw the package of pesticide in the river, field and road. The remainder pesticide will come out from the package after the blowing of the wind and the flush of the rain into the air and the stream. Pesticide in the air can bring risks to human and animals and insects, pesticide in the water can kill the aquatic organisms, such as fish, tadpole etc.

High toxic pesticide methamidophos, which was prohibited to use in the vegetables and fruit trees since Jan. 1, 2005 by the ministry of agriculture of China is still being sold and used in the

vegetable field and fruit trees. A lot of farmers said that they preferred to use methamidophos for it was cheap and rapid effect of killing all kinds of pests. When they were asked if they did not feel well after spraying the pesticide, they said some women felt sick or weak because they were ill well actually. In fact the person who doesn't feel well after spraying pesticide is poisoned. However farmers don't know the mechanism of the pesticide to kill plant pathogens or pests so they can not understand why person will feel uncomfortable, even heavily poisoned after spraying.

According to the interviews with the local pesticide retailers women usually come to the shop and describe the symptom of the disease or the shape, size, color of the pest then the retailers will recommend some pesticide to them. A lot of them are illiteracy so they can not understand toxic level of the pesticide, even they don't know the name of the pesticide that have been used up.

Traditional methods of pests and diseases control are known in this village. *Nilaparvata* sp., *Sogatella* sp. and aphids are controlled by broadcasting plant ash. Locusts in rice and some other crops were captured and fried to eat instead of spraying pesticide to kill.

## **2. Training**

According to the information we collected from the rural community we made out a serial of training courses to reduce the pesticide use.

### **2.1 Training of the hazards of pesticides**

Pesticides are chemicals used to kill the pests, such as insects, fungi, bacteria, weeds, rats, nematodes, acarids etc, and plant hormone that regulates the growth of plant. They will bring loss for the users if they are improperly used. The poisoning symptoms that may occur after spraying are rapid heartbeat, chronic fatigue, blurred vision, memory loss, convulsions, vomiting, dizziness, diarrhea, allergies, cramps, asthma, coma, fever, nausea, headaches even death. However few farmers can understand that most of the symptoms above are brought about by pesticides.



The risks of pesticides to poultry, livestock and human. Poultry can be dead once they eat the pesticide residue leaves of vegetable. Livestock such as goats, pigs, cattle can be very dangerous once they eat the feed with pesticide residue. A farmer told us that her pigs dead after eating the feed polluted by methamidophos last December.

### **2.2 The hazards training of methamidophos**

Some vivid cases of people died because of eating the methamidophos polluted peaches, vegetables were cited to instruct that pesticide is very dangerous. Take for example an old farmer who lived in Shanghai sold some mater convolvulus to workers in a construction base in July 9,2005. After dinner that day 34 workers had the symptoms of cramp. The old man was brought to the court and sentenced to prison for 1 year, and fined 1000 yuan for he produced, sold poison and

dangerous food. Another case happened in Mile country in Yuannan. An old man sprayed methamidophos in his peach trees on May 12, 2004. Six children picked some peaches from the old man's peach tree. After eating 4 children and 2 children had the symptoms of cramp on May 12 and 13 respectively. Because of heavily poisoning one child died on May 13. At night the parents of the victims reported the case to the local police station. Later all parents wanted to accuse the old man of producing poison fruits. However the old man was in nail-biting at that time.

From the cases we can get the conclusion that methamidophos is very dangerous and should be given up to use. So the ministry of agriculture of China has released some acts to prohibit the utilization of methamidophos in agriculture step by step. The mixed formulation registry of the five high toxic pesticides, methamidophos, parathion-methyl, parathion, monocrotophos, phosphamidon would be withdrawn since Jan. 1, 2004. And the mixed formulation pesticide of the above high toxic pesticide would be prohibited to sell and use in China. Since Jan. 1, 2005 enterprises' registry of the formulation of the five high toxic organophosphorous pesticides would be prohibited except the technique material production enterprises. At the same time registry of the pesticides limited to cotton, rice, maize and wheat. Since Jan. 1, 2007 the registry of the formulations of the five high toxic pesticides will be withdrawn and the five toxic pesticides will be prohibited to use in agriculture all over the China.

### **2.3 Alternative methamidophos**

As to the alternative of methamidophos we gave the farmers the information that the formulation of imidacloprid, which was a low toxic and high effect pesticide, was very effective in the control of aphids. Many farmers purchase methamidophos to control aphids, which is very popular in the area. So farmers want an alternative to methamidophos or they can harvest little.

### **2.4 Environment aware training**

As to the packages of pesticides we asked them to describe the change of aquatic organisms and birds since the use of pesticides. They said that the amounts and sorts of fish and birds decreased. Our analysis was that the decrease was partly brought by the arbitrary throw of pesticides packages.

### **2.5 Self-protection training**

In order to prevent the farmers from poison we suggest they should wear mask, rubber glove and exposure suit when spraying pesticides. In the training we cited a case happened in Nanjing, the capital city of Jiangsu Province. On May 23-24, 2004 the contractor of a forestry center asked his employee to spray methamidophos to control the pests. At 8:00 p.m. of June 2 cramp symptom occurred to the employee. June 3 the employee was confirmed of the poisoning of methamidophos. The employee appealed to the court and the contractor was sentenced to compensate the victim RMB165,853.6 yuan. The farmers were shocked by the case. The average income of the farmers in the community was RMB 570 yuan. Once they get seriously poisoning due to the careless operation they will spend a lot of money, even the whole life's earning. Given that the expenditure of purchasing mask, glove and exposure suit is not much they accepted the idea.

### **2.6 Rational use of pesticide**

In the information collection step we found that they used a high volume of pesticides to control the pests, which was irrational. In order to save the use of pesticide and control the pests

effectively we demonstrated the pesticide suspension mix operation to them in the spot. There is utilization guide on the package which tells us when, where and how to use the pesticide. If the pesticide is a powder one we can divide the whole package into equal shares with a stick in the field. Then take what we need according to dilution method on the package. If the pesticide is a liquor one we can take what we need according to dilution method on the package with a injector which is easy to get in the doctor's room.

### **3. Achievements**

After the serial training courses noticeable achievements have been obtained. However pesticide alternative training in rural community is a long-term work which can not realize in one step.

#### **3.1 Change of aware**

Now the farmers changed their view points of methamidophos use. Despite the low price and wide spectrum of pests control the farmers want to give up the use of it because they can not afford the large loss of once somebody is poisoning. And they said that they will use a low toxic one and some said that they would reduce the use of pesticide in controlling the aphids in fababean and cabbage.

#### **3.2 About human and environment health**

The farmers have the idea to protect themselves when spraying pesticide by putting a mask. After training more than ten farmers were randomly interviewed and they give the same answer that they will put on mask when spraying. Farmers said that they will put the pesticides packages in a place far away from watershed and field.

#### **3.3 The improvement of primary aware of pests management**

Pingzhang village is in the Gaoligongshan mountain national reserve where is biodiversity rich place. All kinds of strange plants, insects, animals can be seen here. Aphids will attack the farmers' fababean, cabbages and some other crucifer vegetables. But what will attack aphids? Farmers know that ladybirds and parasite wasps will attack the aphids after training. Ladybirds and parasite wasps are the natural enemies of aphids. If we spray pesticide the natural enemies of aphids will be killed. Because of the absolutely large amount of the aphids they will not be killed all. Next the resistance of aphids to the pesticides will increase so remarkably that pesticide can not kill the them even high toxic pesticide like methamidophos. Farmers begin to know that we should not worry about the occurrence of aphids because the natural enemies of the aphids will come to kill them soon. In fact this a idea of the management of pests.

#### **3.4 Initiative of organic agriculture**

After training of ecological and organic agriculture farmers wanted to try to practice too. Pingzhang is mountainous village far away from noisy city and has natural screen to pollution of industry. So it has predominant geographic conditions to develop organic agriculture. After simple introduction of organic agriculture and ecological agriculture the farmers of the village was attracted by the organic agriculture.

In general the achievements brought by the training are very satisfactory. However the training is ongoing and a lot of unexpected achievement will be obtained.

### **Acknowledgement**

We want to express deep thanks to ICRAF for their finding the project. We want to say thanks to Yang Yanping, Li Juncheng and others have helped us in the implementation of the project.