Main Plant Diseases and Insect Pests
Management Plan of The World Bank
Agriculture Science and Technology Item in
Project Region in Heilongjiang Province

Project Implement Group

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1. General situation

1.1 Plant diseases and insect pests’ management organizing institution and function

Our country separately constituted national grade, province grade, city(county) grade, village(town, country) grade plant diseases and insect pests management organizing institution, every institution all possessed own specific function, answered for its grade plant diseases and insect pests management, pesticide management or farm produce safety production, and so on.

National grade: Agriculture department is the prime management institution of Chinese agriculture. Agriculture department agricultural technique popularizing center answered for countrywide plant diseases and insect pests’ management, national development and innovation committee answered for countrywide pesticide production management. Correlative departments have drawn up a series of rules (such as Pesticide Management Byelaw, Pesticide Management Byelaw Actualizing Ways, Pesticide Production Management Ways) to make plant diseases and insect pests management and pesticide management standardization. At the same time, established a series of farm production standard of criterion, these standards or criterions have specific and strict rules of plant diseases and insect pests’ management and pesticide usage. In order to radically resolve pesticide remaining exceeding standard of farm production especially vegetable, fruit, tea, agriculture department not only reinforced register management of five high toxin organic phosphor pesticides, but also stopped accepting a set of high toxin, intense toxin pesticides registering application, withdrew a set of high toxin pesticides at some crops registering. Pesticides that the country definitely forbade using and high toxin pesticides that forbade using on vegetable, fruit, tea and herbal medicinal materials are give as follows:

There are 18 pesticides prohibited by the state which are BHC, DDT, toxaphene, nemaset, fundex, nephis, nitrofen, aldrin, dieldrin, fussol, etc. There are 19 pesticides prohibited using
in vegetables, fruit tree, tea and Chinese medicinal herb. They are methyl parathion (methyl1605), parathion (1605), monocrotophos, phosphamidon, phorate, sulfotep, demeton, carbofuran, aldicarb, etc. There are 2 restriction usage pesticides, dicofol and fenvalerate, are not permitted in the tea trees. Any pesticide product is permitted to use above the pesticide registering approval usage range.

**Province grade:** Heilongjiang province agricultural office plant protection station answered for forecast of whole province plant diseases and insect pests happen circs, medicament kinds, advices of prevention and cure ways, Heilongjiang province pesticides appraisal institution answered for pesticides registering management, Heilongjiang province petroleum chemical office answered for pesticides production, and made Heilongjiang Province Pesticides Management Actualizing Ways

**County grade:** agricultural office plant protection station answered for forecast of whole county plant diseases and insect pests happen circs, advanced commendatory medicament and commendatory ways of plant diseases and insect pests’ prevention and cure, at the same time, took part in partial pesticides distribution; every county all established agricultural executing law crew, answered for pesticides market management; partial county also constituted related farm production producing criterion of local certain farm production. Because of outlay deficiency, the forecast of county is not very perfect.

**Village grade:** every village of our province all established agricultural technology station, partial country also established agricultural technology station, which answered for investigation and prevention and cure advice of plant diseases and insect pests happen circs in this village or country, simultaneity, took on partial pesticides distribution.
1.2 The actuality of pesticides production and distribution

Pesticides are produced according to these rules by every absolute pesticides production factory. There are about 1000 pesticides production factories, Nanking red sun group, KeSheng, ShaLongDa, Jiangsu Jiangshan, Shandong Huayang are bigger in scale and better in production quality than others.

The pesticides of Heilongjiang province are mostly sold by individual pesticides distribution door, plant protection station, agricultural technology station, agricultural material company, individual pesticides distribution door is the prime. Commonly, pesticides are sold from factories to tradesmen (individual pesticides distribution door, agricultural material company, plant protection station and agricultural technology station), tradesmen distributed to farmer. Pesticides that only accepted “three certificates” can be allowed sold on the markets.

1.3 harming status of main diseases and insects in project Province

(1) Soybean

In Heilongjiang Province, the main soybean diseases includes soybean root rot, soybean cyst nematode, soybean frogeye leaf spot, and soybean mosaic virus; The main soybean insects includes soybean underground insects in seedling, soybean aphid, and soybean borer, and Beet webworm became more and more seriously in recent years.

(2) Rice

In Heilongjiang Province, there are more than 10 insects which damaged the rice, and the leaf miner is the main insect pest in rice seedling; and the rice bollworm, rice leaf roller, rice flying lice, rice thrips is the main insect pest in growth duration. Especially rice leaf roller and rice flying lice often emerged seriously in some years. The main disease of rice includes rice blast, rice sheath blight disease, and bacterial leaf spot.

(3) Wheat
The main wheat insect pest is underground pest, aphid, red mite, wheat midge, and wheat army worm; The main wheat diseases includes wheat rust disease, wheat smut, wheat sheath blight disease, and gibberellic disease, and the wheat sheath blight disease became seriously in recent years. Wheat rust emerged level different in different years, and gibberellic disease also has serious threaten in some years; The main ruderal in cornfield includes dentes foxtail, Japan dentes foxtail, chickweed, burweed, corn gromwell, flixweed, procumbent speedwell and so on, of which dentes foxtail emerged very prevalent, the area of ruderal accountes for 80% of wheat seeding area, when it emerged serious can reduce more than 50% yield of wheat.

(4) Maize

In Heilongjiang Province, the main maize disease includes Exserohilum turcicum, Bipolaris Maydis, heat smut, smut disease, stemrot. The main maize inset peat includes maize pyralid, army worm.

(5) Vegetable

In Heilongjiang Province, the main vegetable in seeding stage includes damping-off, standing blight, root rot the main inset includes cutworm, white grub, ground maggot and so on.

(6) Potato

In Heilongjiang Province, the main potato disease includes potato late blight, viral disease, bacterial ring rot of potato. During the period of potato growing from seeding to harvest, there are many insects damage potato, the main inset includes aphid, potato coccinellid, cutworm, white grub and so on.

(7) Nursery stock

In Heilongjiang Province, grape has been planted in large area, the main grape disease includes black pox, gray mold, anthracnosa, white rot, downy mildew, rust disease and so on, the main inset includes clear wings, chafer, fruit sucing moth and so on, all insets have
been mentioned that the hardest to prevent and cure are grape back pox and clear wings. But we can well control grape black pox and clear wings, prevent and cure other disease, and make a firm base for high yield and rich harvest of grape by integrated control.

1.4 The present status of preventing and curing disease and inset in project Province

   (1) Soybean

   In Heilongjiang Province, there are many soybean varieties, most of them can behave medium resistance or high resistance to disease, but few can resistant to insect pest, so the main methods is chemical control. Every peasant buy and apply the chemical pesticide 3 - 5 time every growing season. The cost is about 450 - 900 yuan each hectare, and the control efficiency is about 60-80%.

   (2) Rice

   No rice varieties the resistance to rice pests, so the main method to control rice pests is chemical pesticide. Hybrid paddy rice is the main cultivation variety now, but few varieties show resistance to rice diseases. Every peasant buy and apply the chemical pesticide 5 - 6 time every growing season with 3-4 pesticides mixture sometimes. The cost is about 450 - 900 yuan each hectare, and the control efficiency is about 60-80%. This control efficiency is very low, and the resistance to pesticide of pests more and more increased.

   (3) Wheat

   The main control method to wheat underground pests is by seed coating, but the cost is high, and the control efficiency is not ideal. The control to wheat sheath blight disease at the tilling stage and elongation stage is not very enough. The pests at the heading stage can be controlled basically. The gibberellic disease emerged paroxysmally, and little care showed on it. The weed in wheat are controlled very well by the chemical herbicide, such as tribenuron-methyl DF.

   (4) Maize

   Many resistance varieties are planted. Field management and chemical control are used.
(5) Vegetable

Chemical pesticide are used to control diseases and pests. Hand weeding is used to control weed.

(6) Potato

Field control and virus-free seedling are used to control the potato diseases and pests.

(7) Nursery stock

Pesticide is mainly used in the disease and pests prevention of grape.

2. The disease, pests and weed management plan in project region recommended

2.1 The prevention method of new disease, pests and weed recommended

The disease, pests and weed management in project region should take the composite modulation of ecological system in agriculture field to be the main body. The manly modulation should be done timely based on the exerting the natural modulation inside the system. The main aim should be optimizing the system structure in manly modulating. High-resistance varieties should be selected, and planting management technique should be innovated. The chemical modulation technique should be used rationally based on the accurate forecasting.

Concrete technique measures

- Establishing the forecasting system with high-accuracy to make the forecasting accuracy attain above 90%.
- Selecting the high-resistance varieties.
- Rational fertilizer and water management, increasing the organic manure and improving the crop growth healthily.
- Making the best use of natural enemies and protecting them, optimizing the ecological environment exerting the natural control ability, lessoning the usage of chemical pesticide.
Enhancing the agriculture technique measurements to cure pests, disease and weed.

Extending the biological pesticide actively.

Using the high-efficiency, low-toxin and low-residual chemical pesticide rationally, and inhibiting the high-toxin and high-residual pesticide.

### 2.2 Pesticide bill to have been authorized

**Soybean:** phoxin, Bata-cypermethrin technical, lamda cyhalothrin, and carbendazim.

**Rice:** Regant □ triazophos, Imidacloprid, Buprofazin □ jinggangmycin, tricyclazole, Diniconazole, Tilt, Pyrazosulfuron-ethyl, bensulfuron2methyl, Butachlor, and Puma.

**Wheat:** phoxin, Bata-cypermethrin technical, lamda cyhalothrin, carbendazim, Diniconazole, tribenuron - methyl, isoproturon, and Puma.

**Maize:** Bt □ phoxin, Beauveria bassiana, and manczeb.

**Potato:** carbendazim, and Chlorothalonil.

**Nursery:** Imidacloprid, Abamectin □ Neem □ Thiodan □ calcium polysulphides, Bata-cypermethrin technical, Beauveria bassiana, polyox in □ Junduqing □ Fuxing □ Diniconazole, carbendazim, manczeb, Bordcaux Mixture, amitraz, and clofentezine.

**Vegetable:** Bt, phoxin, triazophos, Bata-cypermethrin technical, lamda cyhalothrin, midazol-Acyl □ quzalofog-P-ethyl, and Puma.

All of above are all the high efficiency, low toxicity and, low residual pesticide, which all meet the agricultural chemical regulation rule. They are recommended by crop production criterion in Heilongjiang Province, and the forbidden and limited pesticide are not included.

### 2.3 The implementation organizations of disease, pests and weed in project region

(1) **Forecasting group**

The forecasting is the premise and base for chemical prevention. Accordingly, 22 disease, pests and weed inspection spots will be established, and 8 disease, pests and weed forecasting stations will be improved to inspect the disease, pests and weed occurring condition in sub-project regions systematically.
(2) Implementation Group
The disease, pests and weed prevention group at the province group will be established to supervise the disease, pests and weed prevention in the whole province and instruct that in the sub-project region. The experts group is mainly made up of experts from North-east Agriculture University and Plant Protection Institute in Heilongjiang Agriculture Sciences Academy. The corresponding disease, pests and weed prevention group will be set up in the sub-project regions. The group in charge of establishing and implementing the concrete prevention measurements and is mainly made up of technique-supporting units, plant protection station, agriculture technique station in sub-project region and experts.

2.4 The training of the disease, pests and weed management technique

(1) The training content and material
The disease, pests and weed occurring law, prevention method and pesticide usage knowledge will be the main training content. The detailed disease, pests and weed management files and the “clearing paper” by the day will be compiled according to the crop kinds. The farmer door will be delivered one copy in the project region.

(2) Training Plan
At the beginning of the project, a systematic training will be done. Since then, the disease and pests prevention training for each crop will be done before the crop is planted. The brief training will be done at the key period to prevent them, which will make each farmer know the occurring law and prevention methods of disease and pests of his crop.

(3) The outlay budget
The particular outlay budget is seen in the outlay budget of disease and pests management plan in sub-projects.

2.5 The evaluation and report of the disease and pests management plan implementing

(1) The project aim
The project aim is to increase the yield, efficiency and ecological regulating ability, and decrease the loss due to the disease, pests and weed, and decrease using amount of pesticide, and ease the environment pollution. The concrete aim is as following:

- IPM technique will be implemented in the project region, and the composite prevention area will be above 90%.
- The main disease and pests forecasting accuracy ratio should be increased from 70% to above 90%.
- The main disease and pests loss ratio should be decreased from 10% to 5% below.
- The good cycle of economic benefit, social benefit and ecological benefit will be achieved by way of continual control during the whole process of disease, pests and weed prevention.

(2) The inspection of the project implementation effect

The inspection groups at the province level and sub-project level will be established separately to check-up the implementing process of each sub-project, which will help us find the problems timely and correct them timely and sum-up experience and communicate timely. The results of disease and pests management will be investigated and the generalization will be made at the end of the year.

(3) The report of the project implementation effect

The summarizing report of each sub-project will be finished at the end of November, and then the sub-reports will be delivered to the general project group. The general project group must finish the general report before the end of February, and receive the experts’ inspection.

3. The concrete measurements to take

3.1 Enhancing the disease, pests and weed forecasting

The sub-projects regions should cooperate with the agriculture technique and plant protection departments to do well in the disease, pests and weed forecasting work.

3.2 Enhancing the pesticide management
The local governments in some sub-project regions will constitute the related policy and prohibit selling pesticide getting out of line. The pesticide in project regions will be carried out buying and selling in union. The disease, pests and weed in project regions will be practiced to prevent and cure in union based on the forecasting. The construction of agriculture procession executing the law will be enhanced. The agriculture procession will check-up the project regions without day and establish the hot-line for impeaching. The mass will be launched to impeach the pesticide usage getting out of line, and the award will be given to the person who impeach the behavior out of law. The usage of pesticide will be lessoned by way of mutual supervising.

3.3 Enhancing farmers training

There are lots of farmers training in each sub-project region. IPM knowledge is one of the necessary training content. The environment consciousness and prevention level of farmers will be enhanced by training, and the amount of pesticide usage will be lessoned consciously.

3.4 Compensating the farmers’ loss

Some fund from flux fund will be used to encourage the farmers to use IPM technique and lesson the usage of chemical pesticide in some project regions each year during the project implementing process to compensate the farmers’ loss for putting an end to the high-toxin, high-residual pesticide. At the same time, the farmers’ earning will be increased by enhancing the rice produced with IPM technique, which will impel the farmers to use IPM technique consciously in the project regions.

3.5 Enhancing the IPM technique research

IPM is a developing and perfecting technique. With the changing of the ecological community in agriculture field, the disease, pests and weed change accordingly. In order to practice the IPM, the research will be enhanced continuously. The research of disease, pests and weed will be enhanced, and at the same time that of the natural enemies will also be
enhanced. The high-technique applying in IPM will be enhanced. Only the occurring
direction of the biological community in the field is grasped all the time, will the cure be
done purposely and loss belessoned.

4. The soybean sub-project in Heilongjiang Province

4.1 The agriculture planting condition in project zone

(1) The main crops planting structure in project zone

Heilongjiang Province is located on the North-east zone in China, and its total ground area
is 4.54 million sq.km.. It is 4.7% of the total China ground area, and the area status is the
sixth in China. There is 9.512 million sq.km. plowland in Heilongjiang Province, and the
average plowland per person is 7.6mu. The soil character in project zone is rich and flat, and
the water resource is abundant, and the climate is feasible, which are favorable for
developing agriculture production. Heilongjiang Province is the commodity grain production
base in China. Maize, soybean and rice are the main planting crops, and potato, vegetable,
mixed grain and mixed soybean are the subsidiary crops in project zone. The soybean
planting area is 1 million Mu every year. The soybean is planted and reaped once each year,
and the rotation year is 2-3.

(2) The soybean planting condition

The soybean planting method in project zone is by way of combining production contract
door by door, and the average field of each door is 1.2-1.5 ha. The patches of many farmer
door are linked into a large field.

4.2 The analysis of main disease, pests and weeds in project zone

(1) The constitution of disease, pests and weed in project region

*The soybean disease*

The soybean disease is mainly composed of soybean root rot, soybean cyst nematode,
soybean speckle and soybean mosaic virus.

*The soybean pests*
The soybean pests are mainly composed of the under-ground pests at seedlings stage, soybean aphid, soybean pod-bearer, and the grass-hopper has been harmful seriously in recent years.

□The soybean weed

The granineous weeds in the soybean field are mainly dogtail, etc. The composite weeds are cocklebur, dandelion, etc. There are hellebore, plantain, goosefoot, night shade in the soybean field.

(2) The endangering condition and loss degree of main soybean disease and pests

There are many kinds of maleficence crop disease, pests and weeds which endanger the agriculture production, especially the occurring area of disease and pests of main crops, for example rice, wheat, maize and soybean, etc. has been increasing in recent years. The light danger can bring 10-20% loss, and the serious danger can make the plant wilt and die, and the local region can be 100% loss.

(3) The prevention ways and prevention measurements evaluation in existence

The main prevention ways at the moment are spraying pesticide when the disease and pests of soybean are very serious, and the times of using pesticide is 5-7 per growth period. Thus prevention ways are not scientific and have dangerous results.

□The usage fee of pesticide and production cost are increasing because of not taking the principle of “Giving priority to prevention and integrative cure”.

□The prevention effect is not good because the prevention is not proper.

□The usage of lots of pesticide can bring the environment pollution and make natural enemy die or place a premium on pesticide resistance, which will make the farmers prevent the pests more difficultly.

4.3 The composite prevention measurements design of disease and pests in project region

The composite prevention idea is from the general ecology system and based on the main disease and pests endangering condition at soybean growth period. The prevention work is in
accordance with the principle of “giving priority to prevention and integrative cure”. Firstly, the disease and pest kinds and law of occurring, increasing or decreasing and endangering should be mastered generally. The prevention premise should in accordance with the exact forecasting, and based on the agriculture prevention, and strengthen the agriculture technique measurements, and use the chemical prevention, bio-prevention and physical prevention reasonably. The prevention aim is economical and safe and efficient. The dosage and time of using chemical pesticide should be decreasing, and the time and kind of pesticide should be selected rigorously.

(1) The agriculture prevention measurements
The agriculture technique should be used complicatedly to improve the soybean growth condition and decrease the pests happening and development.

- **Reasonable rotation**
Reasonable rotation can create a fitting condition which will be suitable for crop growing and not suitable for disease and pests. The 3-year rotation can alleviate the harm of pests living through the winter in the soil. The rotation systems such as wheat-wheat-soybean, wheat-soybean-mixed crop, wheat-mixed crop-soybean and wheat-wheat-soybean-mixed crop are effective for easing the pest harm. Rotation should be done in the field where pod bearer happened heavily.

- **Clearing away the disease plant residual in the field.**
The disease plant residual in the field should be cleared away after soybean is reaped. The soil should be ploughed and turned timely, and the pests living through the winter in the soil can be endangered. Ploughing can also make the pests onto the soil surface and increase the pest mortality by way of harrowing, pressing, mechanic injure, sun shining, wind blowing, and natural enemy eating. The occurring and danger of pests will decrease next year.

- **Selecting the resistant soybean variety and testing the seeds from other places rigorously**
Resistant soybean varieties with high yield should be choosed according to the natural condition and disease and pests kinds. For example, the resistance to pod bearer soybean
variety has been planted in the North-east farm in recent years, and the harm has been
decreasing obviously. The seeds should be harvested in the field with less disease or pests.
The seeds from other places should be tested rigorously.

- **Intensifying the cultivation management**
  
  a. **Sowing**
  
  Sowing date should not be too early and the sowing depth should not be too deep which may aggravate the disease and pests. Sowing can be done when the soil surface of 0-5cm temperature is 6-8℃. Soybean should not be planted in the bottomland. The planting density should be increasing according to the variety character. The sowing depth is mostly at 4-5cm. If the herbicide is used after sowing and before seedling, the sowing depth should be adjusted.

  b. **Applying the fertilizer**
  
  Increasing the organic fertilizer, using the chemical fertilizer reasonably and matching the N-P-K properly will prevent soybean maturating late which can make soybean growing healthy during the whole growth period.

  c. **Cultivation**
  
  Cultivation should be done at least 2 times, which will improve the soil gas permeability and increase the soil temperature and impel the new roots forming. In the continuous soybean field, cultivation should be done once from the last ten-day of July to the middle ten-day of August, which can build up the pod-bearer eclosion hole and decrease the quantity of imago coming up out of land.

  d. **Assistant measurements:** According to the fact at the soybean growth period, flexible assistant measurements should be taken. If the rain is heavy, the waterlogging and weed should be taken care of.

  e. **Early-ploughing in the wheat stubble field after soybean is harvested**
  
  Early-mature wheat should be planted in the field after soybean has been harvested. Ploughing will be done after wheat is harvested in the first and mid- of August( Sanjiang Plain Region), which will harm the nits of soybean pod-borer (chrysalides) and make pod-borer not out of the soil to bring eggs. It is very effective for decreasing soybean pod-borer danger.

(2) The chemical prevention measurements

- **Using the chemical pesticide reasonably**
a. Providing the pesticide usage bill in the project region

The pesticide used in the project region must be high-efficiency, low-toxin and low-residual. The main insecticide and antiseptic include:

- **insecticide**
  - beta-cypermethrin, beanveria bassiana, etc.
- **antiseptic**
  - carbendazim, CuSO4, ridomil.

- **Controlling the pesticide dosage**

  The forecasting work must be done well, and the pesticide should be used properly.

- **Using the pesticide reasonably**

  The pesticide must be used alternatively. Each kind of pesticide must be used 1-2 times at one growth period, which will avoid happening pesticide resistance. At the same time, the pesticide using time should stagger the natural enemy happening period.

- **The usage operation regulations of pesticide**
### The composite prevention regulations of main soybean disease and pests

<table>
<thead>
<tr>
<th>Soybean growth period</th>
<th>Main disease and pests</th>
<th>Prevention measurements</th>
<th>Management measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Seedling</strong></td>
<td>disease root rot, soybean cyst nematode, pests, soybean stem-miner, two-striped leaf beetle, soybean aphides, onion trips, garden springtail.</td>
<td>50% carbendazim adding 50% thiram(3:2)</td>
<td>Sowing date should not be too early and the sowing depth should not be too deep, which may aggravate the disease and pests. Sowing can be done when the soil surface of 0-5cm temperature is 6-8°C. Soybean should not be planted in the bottomland. The planting density should be increasing according to the variety character. The sowing depth is mostly at 4-5cm. If the herbicide is used after sowing and before seedling, the sowing depth should be adjusted.</td>
</tr>
<tr>
<td><strong>mid-time of growth period</strong></td>
<td>disease frog-eye leaf spot, soybean downy mildew pests, soybean stem-miner, two-striped leaf beetle, onion trips, etc. soybean pod-borer, soybean aphides and soybean red spider</td>
<td>carbendazim 25% ridomil</td>
<td>Cultivation should be done at least 2 times, which will improve the soil gas permeability and increase the soil temperature and impel the new roots forming. In the continuous soybean field, cultivation should be done once from the last ten-day of July to the middle ten-day of August, which can build up the pod-bearer eclosion hole and decrease the quantity of imago coming up out of land.</td>
</tr>
<tr>
<td><strong>Anaphase growth period</strong></td>
<td>disease frog-eye leaf spot, brown grain disease pests soybean pod-borer.</td>
<td>40% carbendazim</td>
<td>According to the fact at the soybean growth period, flexible assistant measurements should be taken. If the rain is heavy, the waterlogging and weed should be taken care of.</td>
</tr>
<tr>
<td><strong>After reaping</strong></td>
<td>Deteriorating the pests condition living through the winter in soil</td>
<td>No pesticide will be used at this stage.</td>
<td>Ploughing can also make the pests onto the soil surface and increase the pest mortality by way of harrowing, pressing, mechanic injure, sun shining, wind blowing, and natural enemy eating. The occurrence and danger of pests will decrease next year.</td>
</tr>
</tbody>
</table>

### 4.4 The project construction content and implementation

(1) The organization institution of project implementation
The expert prevention group for soybean disease and pests will be set up, who will be in charge of enacting and implementing concrete prevention measurements and directing and training the farmers in project region.

The expert group is mainly composed of experts from North-east Agricultural University and Agriculture Sciences Academy in Heilongjiang Province.

(2) The construction of disease and pest forecasting system in project region

A center forecasting station which has 2-3 offices, data transmission and analysis system, information issuing system and communication system will be set up in the project region. 5 sub-forecasting stations will be set up in the project region, and each is equipped with microscope, spore catching system, environment and weather inspecting system and pests inducing systems.

Each administration village will be equipped with one forecaster and 3-5 plant protection technicians. There are 48 forecasters and 150-250 plant protection technicians in the project region. The forecaster will be in charge of the disease and pests investigation and other forecasting work in his village. The plant protection technicians will be in charge of the implementation of disease and pests, such as spreading the information about the disease and pests, providing the pesticide and pesticide instruments, inspecting prevention effect. They should be equipped with simple forecasting instruments, some pesticide applying instruments and vehicles etc.

Outlay prediction: The center forecasting station will need 500,000 Yuan; Each sub-forecasting station will need 50,000 Yuan, and 5 will be 250,000 Yuan; Each administration village will be 20,000 Yuan (Thereinto forecasting instruments 5,000 Yuan, vehicles 5,000 Yuan and 10 spraying machines 10,000 Yuan). The total sum is 1 million Yuan. The 3 items are added to 1.75 million Yuan which will be settled by the project region itself and not engrossing the fund of the project.

(3) Training the plant protection technicians in county and countryside and demonstration door
Firstly, the plant protection technicians in county and countryside are trained by the expert group concentrate. The main training content includes the occurring law, prevention way, pesticide usage knowledge and forecasting ways of disease and pests. Then, the farmers are trained by the plant protection technicians, and the training content includes the occurring law, prevention way, pesticide usage knowledge and forecasting ways of disease and pests. 100 persons of plant protection technicians in county and countryside per time will be trained each year, and 2500 persons of demonstration door per time will be trained each year. The training will be done before each disease or pest happens, and the prediction day of training per year will be 15.

There will be 2600 training persons each year. The training cost will be 500 Yuan per person of plant protection technicians in county and countryside and 100 Yuan for demonstration door. The total training cost is predicted to be 300,000 Yuan (The cost has been listed in the project investment table).

(4) The demonstration and extension of new technology

The main extension technology includes bio-prevention technology, forecasting technology and the reasonable pesticide usage technology, etc.

The extension area is 50,000 Mu.

The outlay is predicted to 2.5 million Yuan (thereinto, 500,000 Yuan has been listed in the project investments, and the rest outlay which doesn’t engross the project fund will be tackled by the project region itself.)

4.5 The inspection evaluation

The demonstration region should reach the guidelines following after the project is implemented.

(1) The pesticide usage amount will be decreasing 30%, and the residual pesticide should reach to the international request.

(2) The disease and pests endangering ratio will be controlled 10% below in the whole project region, and the ratio in 50% area will be 5% below.
(3) The usage ratio of pesticide with high-effective, low-toxin and low-residual will attain 100%.

(4) The biology kinds in project region will be diversity, and the natural enemies should be increasing, and the occurring ratio and degree of disease and pests should be decreasing obviously.