



Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

Ministry of Agriculture and Forestry
Department of Agriculture

No 0879 /DOA
Vientiane, date 22 July, 2011

Technical Guidelines on
Phytosanitary Measure for Protection and Control of the Cassava Mealy bug

To: Head of Agricultural Division of Provinces and the Capital throughout the country

- Pursuant to the Plant Protection Law No 06/NA Dated 9 December, 2008;
- Pursuant to the Regulation on the Management and Use of Plant Variety for crop production in Lao PDR No 0719/MAF dated 3 December, 1997;
- Pursuant to Notification of Minister of Agriculture and Forestry on tightening the Implementation of Plant Protection No 1429/MAF dated 18/11/2008;
- Pursuant to Ministerial ordinance on tightly monitoring and preventing cassava mealy bug's Outbreak No 1501/MAF, dated 23 March, 2011

Lao People's Democratic Republic is a country with an extensive cassava growing industry nationwide which causes a high demand for planting material imported from Thailand, Vietnam and China in large amounts of more than a hundred tons each year. This import practice obviously poses a high risk of infestation of the mealy bug that is a serious threatening insect pest that can be brought into Lao PDR. Therefore, in order to prevent and respond to this emerging problem, it is necessary to understand the history and biology background of this pest and to design control measure applied from the original pathway of infestation up to the destination of production systems together with active surveillance to restrict the infestation from imports and widely spreading within the country which could cause severe damage to the national economy, to assets and would affect the livelihood of Lao citizens.

Therefore, **the Department of Agriculture issued this technical guideline as follows:**

The Provincial and Capital Agricultural Division shall actively collaborate with the extended unit of the district agriculture and forestry offices, local administrative authority and relevant sectors to encourage farmers to monitor and protect their cassava planting fields more intensively through the application of the necessary technical measures as recommended in the following:

1. Introduction of Cassava Mealy bug

Other than being reported to be the major cassava destruction, the mealy bug is also reported to be a pest of many host plants including cashew nut, dragon fruit, citrus, chili, annona, guava, cowpea and pumpkin. The mealybug that causes significant damage to cassava plant comprises 4 important species, including *Ferrisia virgata*, *Phenacoccus madeirensis*, *Phenacoccus manihoti* and *Pseudococcus jackbearleyi*. The most serious species among them is the *Phenacoccus manihoti*. These pests are indigenous to the tropical region South American Continent. Later they had spread extensively to African continent. Recently, this cassava mealy bug has been reported by the Thai Department of Agriculture to be spreading in many provinces of Thailand, it is also actively monitoring and evaluating for any incident of these pests in China, Vietnam and Cambodia.

The life cycle of the mealy bug reproduces by parthenogenetic oviparity. Eggs are laid as groups dusted with white wool, and then they hatched into crawlers and they will develop through three - four instar stages and become adult mealy bug. Adult females of the cassava mealy bug are ovoid and dusted with powdery wax. Some kind of adult meal bug males will have wings which are able to fly around. The total development period from egg to adult lasts for about 33 to 92 days. The mealy bug can grow well in temperature 15 - 34 degrees centigrade and the most favored temperature is 25 degrees centigrade. The population actively multiplies in the dry season and reduces in the rain season. The dispersal pattern of these pests have many pathways such as some species have adults that can fly or disperse passively in the wind, contaminating agriculture tools and infesting planting material or plant parts of the cassava.

The mealy bug can attack all parts and growing stages of the cassava, it causes damage to the plant by sucking nutrition from leaves that causes abnormal colors and drop down as a consequence. Furthermore, the mealy bug produces honeydew or sooty mold that creates black mold causing a reduction of the photosynthesis process and, in the end, the productivity of cassava is decreased or root starch is not produced. In addition, the effect on the plant can manifest itself in many parts and varying symptoms such as distorted cassava tips, plant stunted or dwarfing, dead heart; abnormal forms of growing point and stem.

2. Controlling Measures on the Supply of Planting Material

- The variety of cassava intended for growing shall be registered by the Department of Agriculture to certify that it is suitable for production in Lao PDR as prescribed in the Regulation on Management and Use of Plant Variety for crop production No 0719/MAF, Dated 3 December 1997.
- Before planting materials are imported, they shall be subjected to pest risk analysis and permitted by the Department of Agriculture; importers are required to submit the plan of use and distribution the planting material for future monitoring and inspection accordingly. .

- The planting material of cassava shall be imported from the areas that are certified free from incidence of cassava mealy bug and accompanied by a phytosanitary certificate issued by the National Plant Protection Organization of the original country that complies with the import conditions described in the import permit issued by the Department of Agriculture of Lao PDR.
- The planting material allowed to be imported shall be sampled to detect the infestation of mealy bug by a plant protection officer based on technical standards of plant protection at the border checkpoint. In case that the target pest is detected, the infested planting material shall be treated by soaking it into any of 3 recommended chemical insecticides including Thiamethoxan 25% WG, Emidacioprid 70% WG and Dinotefuran 10% WP. The application must follow the instructions on the label of its container. After treatment, planting material must be re-inspected by a plant protection officer to certify that it is free from infestation.
- Enhance the coordination with all relevant sectors working at the border check point, especially Custom officers, to control the movement and strictly inspect the import of planting materials according to the rule. In case the import does not comply with the regulations and the law or it is smuggled, such planting materials shall be detained for treatment according to the technical procedure mentioned above. In addition, the offender shall be warned and pay any charges for disinfestations, fines or penalties.
- Any production source for the supply of planting materials within the country shall establish a production plan and ask for inspection and certification from the Provincial and Vientiane Capital Agriculture Division to ensure that the field is free from infestation of the cassava mealy bug. It is prohibited to distribute any infested planting materials. If such a case is found, the offender must be fined or sent to court for prosecution in particularly where severe loss or damage is caused to others from the use of infested planting material.

3. Measures on the Farm for Reducing the Threat of Cassava Mealy bug

- The planting season shall be properly selected. In the rainy season particularly, planting shall be carried out in early May or during the period of continued rain which will contribute to the reduction of the population of the cassava mealy bug during the first 3 months when the cassava seedlings are at the stage of low-tolerance. In areas where epidemics of this pest have occurred, the dry season must be avoided for planting because this condition favors to the development of the cassava mealy bug.
- Cassava varieties shall be carefully selected to ensure that they adapt well to the conditions of the area and are free from infestation of the cassava mealy bug. Planting material shall be between 8 - 12 months old and it must be planted within 15 days of harvesting.
- Cassava field shall be regularly monitored at least once a week and more frequently if the rain is delayed for several days or during drought when temperatures rise above 25 degrees centigrade. Surveillance shall be carried out

by walking across the planting area. In the case of the cassava mealy bug being found during a survey and on the shoot of 1 - 2 plants the symptoms of leaf curl appear, the shoot must be cut out or the whole plant shall be removed to be destroyed by taking it away from the field and burning it.

- In case the inspection find the detection of more than 3 infested plants, the whole planting area must be sprayed using a recommended insecticide and the technical procedure published by the Plant Protection Center from time to time. It is also required that instructions should be asked for from the District Agriculture and Forestry Office to avoid any misuse of insecticide that could cause resistance by the target insect and have a negative impact on the environment particularly on other insects that can control the mealy bug. In addition, in order to avoid any un-economical expenditure for chemical control, in the case of a serious epidemic, it is recommended that cassava must be harvested 8 months after planting.
- In the production area where cassava has been growing continuously for more than 2 seasons, soil must be improved by using manure or compost in application rates of 2 ton/lai or alternately legumes can be planted to be then incorporated in the soil by plowing. This can improve soil structure to have better absorption of nutriments and raises resistance by the cassava to attack of mealy bug.
- In production area where a heavy epidemic has occurred, any plant residues or any remaining parts of the cassava after harvest must be removed and burned away from the field then plowed by reversing the soil for sundry for at least 14 days.

4. Monitoring, surveillance and dissemination

- The movement of planting material within the country shall be regularly monitored and inspected particularly for transports from an area where the epidemic of cassava mealy bug has been announced by the Department of Agriculture. In the case of this pest being detected, the recommended treatment measures as described above must be applied.
- A dissemination and awareness campaign shall be made intensively to all communities on the severe damage and the need for monitoring incidence of pest based on the technical guidelines elaborated from time to time.
- Companies that enter into contracts with farmers on that produce cassava shall collaborate with the district agriculture and forestry office to access more information on the technology to control the cassava mealy bug based on the technical guidelines of the Department of Agriculture
- Agricultural Division should notify and disseminate to entrepreneurs the plan protection laws and procedures on how to apply for an import permit under the plant variety management regulation in their own province.
- Strictly monitor and take measures against any person selling pesticide which is not registered and is unauthorized at the plant protection border check point as

well as any behavior or advertising information on control measure that is not consistent with the recommended techniques and is against the laws.

- Coordinate with the Plant Protection Center, Agricultural Division to develop network from central to the villages to regularly monitor and report using telephone and in writing to the Plant Protection Center, Department of Agriculture.
- Encourage companies that provide planting material to implement control measure and they must ensure that planting material distributed to farmers shall not be infested with the cassava mealy bug.
- Provincial and Vientiane Capital Agricultural Division shall coordinate with local administrative authorities to make a plan for controlling cassava the mealy bug in the long term and short term using the instructions from this guideline or by enquiring with the Department of Agriculture for more technical information.

Therefore, this notification is released for effectively implementation and reporting of any constrains to the Departments of Agriculture regularly.

Director General
Department of Agriculture
Dr. Monthathip CHANPHENGXAY

CC.

- Ministers of Ministry of Agriculture and Forestry 1 set (to report)
- Permanent secretary office, MAF 1 set (to report)
- Provincial and Vientiane Capital Administration office 1 set (to be aware)
- Departments, agency and Institution within MAF – each per 1 set (t be aware)
- Department of Custom, Ministry of Finance 1 set (to seek cooperation)
- Department of Import and Export, MOIC 1 set (to seek cooperation)
- National Archives department 1 set (to be aware)
-
- Provincial and Vientiane Capital Agricultural and Forestry Department 1 set
(give direction)
- Plant Protection Center 1 set (to take action)
- Plant Protection Border checkpoints 1 set (to take action)
- Copied/stored 1 set (to acknowledge)
-