

SPECIAL PROJECTS

PSU Explores Biofuel Production and Research

Capitalizing on the vast land area of more than 1000 hectares of marginal lands, Pangasinan State University established the Biofuel Research and Enterprise Development for Region I in its Infanta Campus in Infanta, Pangasinan.

PSU Infanta though the smallest campus in terms of population has the widest land area of 1000.197 hectares of arid, mostly unproductive marginal land and is approximately eight kilometers away from the town proper. With the budget allocation by CHED, the Infanta campus initially apportioned 15 hectares for the program which aims to utilize the *Jatropha curcas*, locally known as the *Tubang bakod* or *Tagumbao* in Ilocano, as source of renewable energy.

Jatropha as source of biofuel

Jatropha (*Jatropha curcas* L.) is a drought resistant perennial shrub or small tree whose seeds can be processed to produce *Jatropha* oil which can then be converted into biodiesel.

The seeds, which produce oil, become mature when the capsule changes from green to yellow, after two to four months from fertilization. The blackish, thin-shelled seeds are oblong and resemble small guyabano seeds.

Found throughout the Philippines, *Jatropha* has an economic life of up to 35 years and can live for 50 years. It grows fast, with little or no need for maintenance and

can reach a height of three to eight meters. It grows almost anywhere—even on gravelly, sandy and saline soil. It can thrive on the poorest stony soil. The leaves shed during even in the crevices of rocks. The leaves shed during the cold months form mulch around the base of the plant. The organic matter from shed leaves enhances earthworm activity in the soil around the root-zone of the plants, which improves the fertility of the soil. Regarding climate, *Jatropha curcas* is found in the tropics and subtropics and likes heat, although it does well even in lower temperatures and can withstand a light frost. Its water requirement is extremely low and it can stand long periods of drought by shedding most of its leaves to reduce transpiration loss. *Jatropha* is also suitable for preventing soil erosion.

Alternative Diesel

It is significant to point out that, the non-edible vegetable oil of *Jatropha curcas* has the requisite potential of providing a promising and commercially viable alternative to diesel oil since it has desirable physicochemical and performance characteristics comparable to diesel. Based on extensive testing done in countries who pioneered the utilization of *Jatropha*, three kilos of seeds can produce a liter of crude *Jatropha* oil.

The Biodiesel Project in Infanta

Headed by the Campus Dean Dr. Marciano M. Llandado, as the Program Manager, the program intends to establish a *Jatropha* pilot plantation, produce plating stocks, and conduct research on nursery production systems. The Dean is supported by the Program Operations Manager and Research Department Head, Mr. Larry Santos, who is responsible for the day to day activities of the program.



Seedlings of opportunity. The project has generated jobs for the local farmers of Infanta.



Caring the Young. Sheds were constructed to protect the *jatropha* seedlings from too much heat of the sun and heavy rains.



Jatropha Project

Aside from being an income generating project (IGP), the program has generated countless jobs. Farmers, women and out of school youth were hired and more people will be needed to work in the future when the program reaches its peak of operation. To date, the program has produced 18,000 seedlings out of the 50,000 seeds bought from PFC and nearby municipalities. The team targets to produce 115,000 seedlings for the establishment of plantation located at the *Pao* area. Since the germination rate of jatropha seeds is very low at 20%, the team is presently conducting several researches on how to improve the production of stocks.

The University has signed a Memorandum of Agreement (MOA) with the Philippine Forest Corporation (PFC) to ensure market for jatropha seeds.

Supported by a strong advocacy from the academe, the program is also designed to promote awareness among students and farmers on energy conservation and promotion of indigenous materials as alternative source of energy. The program may eventually make PSU as the center for biofuel research for Region I.

Clonal Propagation of Banana and Makapuno

PROJECT DESCRIPTION

The project will be undertaken at the PSU Tissue Culture Laboratory, Sta. Maria, Pangasinan with the involvement of the well-trained staff presently detailed at the Laboratory. At present, the Laboratory can accommodate multi commodities with its complete facilities (Preparation, Transfer and Culture Rooms and with two (2) nurseries) since it has started its operation since June 2000.

The project will be on mass propagation of banana plantlets, makapuno seedlings, jathropa seedlings and ornamental plants through tissue and embryo culturing.

Tissue culturing of banana plantlets, jathropa and ornamental plants will take a period of six (6) months before it could be disposed. Activities to be undertaken within the six months period will be the following: collection of planting materials, stock solution preparation, media preparation, aseptic culturing (culture initiation, multiplication of shots and regeneration of plantlets) and acclimatization of cultures in bottles.

Banana, jathropa and ornamental plantlets will take two (2) months in the nursery before it could be disposed to end-users. At this stage, banana plantlets will be ready for field planting.

Embryo culturing of makapuno will take a period of twelve months (7 mos. at the laboratory and five (5) mos. at the nursery) before it could be sold to buyers.

Status of the Project as per objective (Year 1)

1. Improve productivity of banana and makapuno through tissue and embryo culturing
 - 1.1 Laboratory - 50% accomplished- Aseptic Culturing - 1st to 8th sub-culturing
 - 1.2 Nursery - 50% accomplished (1629 plantlets)
2. Help the countryside young farmers globally competitive through application of modern technologies and relevant information.
 - 2.1 Continuing scouting of possible beneficiaries