

COMPONENT 1

GERMPLASM MANAGEMENT, VARIETAL IMPROVEMENT AND SEED TECHNOLOGY R&D FOR PHYSIC NUT (*Jatropha curcas* L.)



Activities

- Activity 1.** Conserving the Genetic Diversity of Physic Nut (*Jatropha curcas* L.) through Collecting, Characterization, Conservation and Documentation of Local Germplasm
- Activity 2.** Varietal Improvement of Physic Nut (*Jatropha curcas* L.)
- Activity 3.** Seed Quality Testing, Storage, Enhancement, and Seedling Establishment of Physic Nut (*Jatropha curcas* L.)



GENERAL OBJECTIVES

- To be able to assemble, conserve, characterize, document and promote the utilization of local germplasm of *Jatropha*
- To evaluate, select, develop and propagate improved, commercially desirable varieties of *Jatropha* for local production.
- 3. To conduct basic research on the seed technology aspects of *Jatropha curcas* and produce protocols and learning materials out of the results of this research.



Activity 1. Conserving the Genetic Diversity of Physic Nut (*Jatropha curcas* L.) through Collecting, Characterization, Conservation and Documentation of Local Germplasm

Highlights of Accomplishments:

Activity 1a. Collecting of *Jatropha* sp. Germplasm

- Areas Collected: 14 regions, 39 provinces, 223 towns, 417 barangays
- Major Areas Collected: 8 regions, 28 provinces, 206 towns, 391 barangays





Activity 1. Conserving the Genetic Diversity of Physic Nut (*Jatropha curcas* L.) through Collecting, Characterization, Conservation and Documentation of Local Germplasm

Germplasm collection

- *Jatropha curcas* 535 accs.
- *Jatropha gossypifolia* 45 accs.
- *Jatropha podagrica* 28 accs.
- *Jatropha pandurifolia/Jatropha hastata* 29 accs.
- *Jatropha multifida* 17 accs.
- **Total** 654 accs.

*Passport data for all collections in database



Activity 1b. Characterization and Conservation

- Descriptors' List for *Jatropha* – NPGRL devised own descriptor; standardization is on-going
- Form for on-site characterization was devised (tree age, tree vigor, leaf color, leaf lobing, number of fruits per inflorescence)
- Characterization of biodiesel feedstock - % oil, % FFA and profile, % sterol, steryl ester (high % oil and low FFA)
- Conservation: Field genebank, nursery and seed genebank
- *In-vitro conservation* – protocols being developed for *in vitro* conservation and regeneration of species of *Jatropha*



Table 1. Summary of morpho-chemical characteristics, 87 accessions of *J. curcas*

Seed Data	On-site Data	Chemical Properties
Length (cm): 1.60-1.98	No. fruits/cluster: 2 - 15	% Oil: 12.50 – 57.87
Width (cm): 1.03-1.16	Tree Age: 8 mos. – 20 yrs – 70 yrs	% Steryl ester: 0.00 – 16.60
Weight (g): 0.13 – 0.789	Tree Vigor: Low – High	% Sterol: 0.00 – 7.30
% MC: 2.874 – 10.00	Mature leaf color: Green to dark green	% FFA: 0.00 – 42.28



In Vitro Conservation

- Conservation *in vitro* offers medium-term (1-2 years) to long-term storage or through cryopreservation of different crops (10-15 years).
- 11 *Jatropha curcas* accessions were cultured in vitro using MS basal media
- After two (2) weeks nodal cuttings were excised & cultured into cytokinin supplemented media
- The experiment is on-going/ under observation



Excision of embryonic axes from seeds of immature fruits



Planting in MS media



In vitro cultures of *Jatropha curcas*



In vitro cultures of *Jatropha curcas*



Potted Out *In vitro* cultures of *Jatropha curcas*



Potted Out In vitro cultures of Jatropha curcas

