

Commercial Production and Utilization of Sweet Sorghum (for Ethanol, Food, Feed and Forage) implemented by the Mariano Marcos State University in 2006. The project was conducted in Regions 1,2,3 and CAR; Oriental Mindoro, Negros Occidental, Capiz, Bohol, North/South Cotabato, Sultan Kudarat, Bukidnon, Zamboanga and Davao.

Eight (8) promising sweet sorghum varieties came from ICRISAT and were used for multi-location tests. Newly acquired lines from ICRISAT and other sources totaled to 250. There were 65 recipients of sweet sorghum seeds mostly farmers, government agencies, investors, feed millers, food processors and other interested individuals.

Study showed that of the eight sweet sorghum varieties, only five (5) showed adaptability to local conditions in MMSU. Below is a table showing the agronomic characteristics of the different ICRISAT sweet sorghum varieties.

Variety	Stripped Stalk Yield (t ha)			Grain Yield (tha ⁻¹)		Percentage Sugar by Brix's
	Seed Crop	1 st Ratoon	2 nd & 3 rd Ratoon	Seed Crop	First Ratoon	
NTJ 2	45-50	48-55	51-60	3.62	4.40	18.5
SPV 422	55-60	57-65	62-73	3.28	3.92	19.0
ICSV 700	43-48	45-50	47-54	3.46	4.11	18.0
ICSV 93046	47-52	48-55	52-59	3.40	4.08	15.0
ICSR 93034	46-52	47-53	50-55	3.46	4.25	18.0

A second adaptability trial is being conducted at MMSU for additional twelve (12) new promising varieties of sweet sorghum.

Trainings. Three (3) trainings for focal persons for the multi-location testing were conducted in April, October and November 2006. Interested investors participated during the trainings particularly First Philippine Biofuel Resources Corporation, HAZCHEM, Inc. and Philippine Ethanol Corporation with 5, 7 and 1 participant(s), respectively. Other investors visited MMSU and got materials for their trials. These are Fuel Inc. (SEAOIL) and Ginebra San Miguel Inc (GSM) on fermentation studies ; and San Carlos Bio-Energy; Jared Barker (Cotabato); Philippine Ethanol Corporation (Yujuico Group); Sweet Crystals in Pampanga, Obando Group in Negros and Absolut Chemicals, Inc. in Lian Batangas on adaptability tests.

In 2006, the Department of Agriculture-Bureau of Agricultural Research, in collaboration with experts from MMSU and UPLB conducted a study on the feasibility of using sweet sorghum as feedstock for ethanol production. The study found out that using sweet sorghum as feedstock is comparable if not better than using sugarcane for ethanol

production. The study was concluded immediately prior to the enactment of the Biofuels Law.

In 2007, the DA-BAR funded the project entitled “Performance Evaluation of five Promising Sorghum Varieties under Davao City Condition”. Initial data yielded only the following parameters: plant height, stalk yield and stripped stalk yield in tons per hectare. Data on juice extract and sweetness and second trial is currently being conducted.

Before the end of 2007, DA-BAR has funded nine (9) multi-location trials of sweet sorghum varieties to develop site specific technologies implemented by DA-ILIARC, CAR, MIMAROPA, Region IVA, EVIARC, RFU VI, WESMIARC, BIARC, and SMIARC. The National Upscaling Program for Sweet Sorghum has been set-up to this effect. As such, HAZCHEM, Inc., has established a 5.4 ha plantation in Barangay Bancuro, Naujan, Oriental Mindoro. They have established a juice concentrator using rice hull as fuel, acquired a mobile cane crusher and fermentation tanks. The concentrated juice will be fermented and brought to Barangay Makiling, Calamba, Laguna for distillation. The company is the first to conduct trials starting from planting to distillation

In the Bicol Region, through a collaborative undertaking of BAR, MMSU and BIARC the expansion of the varietal screening of sweet sorghum for nationwide adaptability and replicability was conducted. Region-wide commercialization is being targeted by BIARC which includes development of village-level technologies such as molasses, organic fertilizer, pops from grains, and macaroons.

As an offshoot of this project, the Tropics Agro Industries Incorporated initiated a 5-hectare commercial production for grain sorghum with plans for 60-100 hectare expansion for the next cropping season. The owner is also preparing to establish an ethanol production plant for their sweet sorghum plantation. BIARC and Tropics Agro Industries Incorporated are planning to conduct a technology forum on sweet sorghum to convene a sweet sorghum industry in Bicol.

Thus, in preparation for the setting-up of distilleries by private investors, DA-BAR is promoting the utilization of sweet sorghum by-products such as wine (basi), vinegar, jaggery or syrup, flour, pop sorghum and sorghum cookies. To accomplish this, DA-BAR initiated the conduct of Village Level Commercial Production and Utilization of Sweet Sorghum and funded a project on “Improved Packaging of Sweet Sorghum By-products.” These activities will enhance the Feedstock Development Program of DA under the Biofuels Law of 2006 (RA 9367).

In support with the Bureau of Soils and Water Management’s “Agri-Park on Hillyland” project, the Bureau is planning to set-up a sweet sorghum technology demonstration area for interested farmers, investors and other individuals.

DA-BAR is also collaborating with stakeholders from the industry, specifically, small oil companies such as Fuels Inc., Asian Fuels, Inc., Sea-oil, Inc., Basic Petroleum; Eastern Petroleum; and Pampanga Industrial Park Corporation, among others. The effort focuses on the utilization of sweet sorghum as feedstock for ethanol production, either in single of multi-feedstock configuration.

As for coconut and sugarcane, no techno demo or further studies were supported because these are already being utilized as feedstock for biofuel. The Philippine Coconut Authority and Sugar Regulatory Administration are actively promoting these feedstock. The Bureau of Agriculture Research is presently coordinating the conduct of feasibility studies and other research for jatropha and cassava as biofuel feedstock.

Source of Seeds of Sweet Sorghum: Bungon Seed Producer's Multi-purpose Cooperative, City of Batac, Ilocos Norte (supervised by DA-BAR/MMSU Researchers)

Volume of production – 13, 558 kg
 Capacity - can produce any volume required by the industry
 How much - PHP 50.00/kg FOB

Techno-demo Sites	Area (hectares)
Barangay Bungon, City of Batac	20.8
Barangay Baay, City of Batac	2.5
Barangay Quiling Sur City of Batac	3.2
Barangay Bancuro, Naujan, Oriental Mindoro	5.4
Philippine Ethanol Corporation, Sultan Kudarat, General Santos City, and South Cotabato	6.0
Jared Barker, Banga, South Cotabato	5.0
San Carlos Bioenergy, San Carlos City	2.0
Absolut Chemicals, Inc., Lian, Batangas	0.5
Paracelis, Ifugao	2.0
Alfonsolista, Ifugao	3.0
First Biofuel Resources Corporation Malasiqui, Pangasinan	5.6 ha