Project Report

Financial Assistance to Farmers in Clusters for

Sugarcane Cultivation with Hand Holding Program

Department of Agriculture

Mising Autonomous Council

Gogamukh :: Dhemaji

Introduction:

Sugarcane (*Saccharum SP*) is a cash crop and it is the largest crop of the world by production quantity. It is a plant native to the warm temperate to tropical regions. By FAO estimation of 2012, sugarcane is cultivated on about 26 million hectares of land world over.

The main produce of sugarcane is Sugar. Almost 80% of the world's sugar is obtained from sugarcane, the rest being obtained from sugar beets cultivated in the colder temperate regions. Apart from sugar, other products obtained from sugarcane are molasses of jiggery and ethanol. Besides, sugarcane is eaten raw and required in various Hindu rituals.

The largest producer of sugarcane in the world is Brazil followed by India, China, Thailand, Pakistan and Mexico. As a native crop, sugarcane cultivation in India dates back to BC era.

As the two major emphasis of the Advisory Committee of Mising Autonomous Council for development of agriculture in MAC area is **crop diversification** and **introduction of cash crop**, it is planned to introduce sugarcane cultivation in non-traditional areas with technical guidance from **Sugarcane Research Station,** Bura Likson under **Assam Agriculture University**. A daylong workshop was held on 18-7-2014 at MAC HQ attended by Dr. Bijnan Chandra Bordoloi, Chief Scientist of SRS and his colleagues wherein, the potential of sugarcane cultivation in MAC area was thoroughly discussed and later, the Executive Council of MAC drew up a plan to provide financial assistance to initially 60 farmers for sugarcane cultivation with hand holding program for transfer of technology.

Package of Practice for Sugarcane Cultivation

(Source: Sugarcane Research Station, Bura Likson, Dergaon.)

Selection of Setts:

Top tender portion of the cane (Sett) is suitable for planting. Late shoots and late planting canes also provide good planting material. Each sett should be 3 to 4 budded. Setts should be disease free particularly from red rod and borer infestation and therefore they should not be collected from fields having reports of disease.

For obtaining good quality planting material in large quantity, it is advisable to raise a separate seed crop with extra care. Late planted crop, planted in June-July, provides good quality setts in next spring. Besides the usual fertilizer dose of 135:70:60 kg/ha of NPK, an extra dose of 65 Kg N (145 Kg of Urea) should be top dressed to the crop in October.

Treatment of Setts:

Setts are to be treated before planting by dipping the in 0.2% solution of captan, mancozeb or 0.1% carbendazim. In the process of treatment, when the solution gets reduced by 50%, it should be brought to the original volume by adding solution of equal strength.

Selection of Site and Land Preparation:

Areas free from water stagnation should be selected. Trenches/furrows of 25 cm width and 20 cm depth should be made in well prepared soil at distance of 75-90 cm. Bottom of the furrows should be loosened by light hoeing before application of manure and fertilizer.

Manures and Fertilizers:

Compost or FYM has to be applied @ 10 T/ha in trenches/furrows before planting. Besides, the following fertilizers should be applied as per rate shown in the table.

Nutrient	Requirement (kg/ha)	Form	Quantity	
			Kg/ha	Kg/Bigha
N	135	Urea	300	40
P_2O_5	70	SSP or	440	60
		MRP	350	50
K_2O	60	MOP	100	15

Alternatively the following fertilizers may be used:

Nutrient	Requirement (kg/ha)	Form	Quantity	
			Kg/ha	Kg/Bigha
N	135	Urea	235	34
P_2O_5	70	DAP	150	20
K_2O	60	MOP	100	15

Granulated mixed fertilizer may also be used instead of the above fertilizer. The per hectare requirement of mixed fertilizer of 15:15:15 grade is 450 kg (64 Kg/bigha) which should be applied in trenches/furrows followed by top dressing of urea @ 150 kg/ha or 21 kg/bigha.

Time and Method of Application of Fertilizer:

Entire quantity of phosphatic and half of potassic fertilizers are to be applied in furrows/trenches and mixed well with the soil before planting the setts. Nitrogenous fertilizers are to be applied in two splits – $1/3^{rd}$ at the time of planting and $2/3^{rd}$ at first earthing up. The remaining half of the potassium fertilizer should be completed within 90-100 days of planting.

Method of planting:

Three or four budded setts should be planted by end to end method in trenches/furrows. Setts should be covered lightly with about 5 cm soil.

Seed Rate:

About 45000 to 52000 setts (6.5 to 7.5 ton) are required for planting one hectare. The requirement per Bigha is about 6000 to 7000 setts or about 1 Ton.

Time of Planting:

March is suitable for planting sugarcane (spring planting). Early planting (late January-February) is advisable where irrigation facility is available. When autumn planting (October) is done it is necessary to put a companion crop of mustard in between cane rows.

Weed control:

One weeding should be performed within 30-35 days of planting followed by another within 60-90 days of spring planted crop. In case of Autumn crop, weeding should be done as and when necessary.

Earthing up:

A light earthing up should be given to fill trenches/furrows within 45-60 days after planting. The second earthing up should be done 75-90 days after the first earthing up. The second earthing up will transform the trenches/furrows into ridges and create furrows between the ridges which will facilitate drainage of excess water during high rainfall.

Stripping and propping:

During the growth period of cane, the old and dry leaves should be removed. The canes should be provided mechanical support to prevent lodging.

Plant Protection:

(a) **Termites, red ants and white grubs:** Malathion 5% dust @ 20-25 Kg/ha should be applied to the trenches/furrows before planting. Alternatively chlorpyriphos 20 EC pf 0.02% strength may also be used.

(b) Borers: Spread of stem borer attack in May-July can be checked by burying/burning of infested canes. Any of the following insecticides may also be used against these pests. Two to three rounds of fortnightly spraying starting from the rush of egg laying should be given.

Insecticide	**Quantity**	**Water requirement (litre)**	
		Hand Sprayer	**Power Sprayer**
Per Hectare			
Phosphamidon	400-500 ml	800	200
Fenitrothion	1-1.5 Litre	1000	250
Endosulfan	1-1.5 Litre	1000	250
Monocrotophos	1-1.01 Litre	1000	250
Per Bigha			
Phosphamidon	60-70 ml	120	30
Fenitrothion	150-200 ml	120	30
Endosulfan	150-200 ml	150	35
Monocrotophos	150-200 ml	150	35

(c) Wooly aphids, mealy bugs and thrips: These pests can be controlled by the application of any one of the following insecticides, if felt necessary.

Insecticide	Quantity	Water requirement (litre)	
		Hand Sprayer	Power Sprayer
Per Hectare			
Malathion	1.5 Litre	800	200
Phosphamidon	400-500 ml	800	200
Dimethoate	1.0 Litre	800	200
Per Bigha			
Malathion	200 ml	100-200	25
Phosphamidon	60-70 ml	120	30
Dimethoate	150 ml	150	25

(d) Red Rod (*Colletotrichum falcatum*): Red Rod infested canes dry up and ultimately die. The canes become shriveled, the leaves and the leaf sheaths dry up and when the stem is split open characteristic reddening of internal tissue with white transverse bands are observed. Prevention is the best measure to control this disease and therefore, only disease free setts should be used for planting. Water stagnation in the field should be avoided and rogueing of the affected plants should be practiced. Canes of the disease affected field should be harvested early and stubbles should be burnt. Field should be newly planted after 4-5 months. Ratooning should be discouraged.

(e) Wilt (*Cephalosporium sacchari*): Measures similar to Red Rod should be adopted.

Harvesting:

Sugracane is harvested at the ground level. Late suckers should be removed at the time of harvesting. Sugarcane is ready for harvesting when the desired level of sucrose is attained in juice of different varieties. In non-flowering varieties, the maturity is indicated be cessation of of growth characterized by leaves appearing to emerge from a single point. In the case of flowering varieties, harvesting has to be completed within two months of flowering.

Sett Preservation:

During dry months (December to April) setts can be preserved by adopting “deep trench trash-cover” method in which three budded setts are dipped in a solution of chlorpyriphos 20EC@ 2 ml/li for 30 minutes before keeping in narrow trenches. Setts are to be covered with dry trash and water should be sprinkled twice a month.

Ratoon management:

Field should be properly cleaned after harvesting and ridges should be broken down by hoeing or ploughing. Stubbled should be cut with sharp knife at ground level for uniform establishment of the ratoon. Gaps in ratoon should be filled up by planting pregerminated materials within a month of harvesting of the crop. One three budded pre-germinated piece of sett of each 25 cm gap is sufficient.

FYM/compost should be applied immediately after breaking the ridges. NPK @ 150:70:60 Kg per ha respectively should be top dressed in two splits. Half of the fertilizer should be applied at first earthing up and the second half at second earthing up within 60 days of stubble shaving.

The ratoon crops can be raised profitably by proper management practices. Ratooning for more than 2 years makes the crop liable to damage by insects and diseases.

Feasibility of the Scheme:

The climatic condition of Assam and as such in entire MAC area is suitable for sugarcane cultivation and people are well acquainted with it. The soil condition required is up-land and there should not be any water stagnation. It grows well in sandy loamy soil that is the main soil type in the riverine areas of Brahmaputra and its tributaries. The Sugarcane Research Station under AAU has developed a number of varieties suitable for the climatic and soil condition in Assam. The crop that is being proposed to be cultivated is autumn (October) crop which will be well established by next month and therefore will be unaffected even partial submersion during flood. As the MAC together with SRS, Buralikson with provide financial and technical assistance to the farmers with hand holding program the project will be successful in achieving its objective.

Objective of the Project:

The objectives of the project are:

1. To introduce sugarcane as a cash crop in MAC area.
2. To encourage farmers for crop diversification.
3. To provide financial assistance to marginal farmers for sustainable growth.
4. To encourage farmers for scientific agricultural practice in place of traditional practices.
5. To produce certified sugarcane seed/planting material of high yielding variety for expansion of the crop.
6. To develop entrepreneurship in MAC area.

Profitability of Sugarcane cultivation:

If the prescribed package of practice is strictly followed, 50-75 tons of sugarcane can be harvested per annum from one hectare of cultivation. Considering production of average 60 tons of sugarcane @ Rs. 3200/-, the farmer can earn a gross amount of Rs. 1,92,000/- from one hectare. The farmer will earn more profit from the 2nd year as his expenditure in planting material and plant protection by fencing will be zero from the 2nd year onwards. The cost of transporting the planting material from Sugarcane Research Station, Bura Likson, Dergaon is only for the initial year as subsequent planting material will be produced locally later on.

Selection of Clusters:

Although sugarcane is cultivated as a major crop in certain areas of MAC like the Gelabeel Constituency and Majuli sub-division and as a minor crop sporadically in some other pockets, it is now proposed to be introduced in new areas to encourage farmers to adopt sugarcane cultivation as a major cash crop and to produce certified Sugarcane seed/planting material of high yielding variety for further propagation in entire MAC area.

It is proposed to organize 3 to 5 farmers having a contiguous plot of land measuring 6 Bighas as a Joint Liability Group and to provide them technical and financial assistance for sugarcane cultivation. This will reduce the cost of plant protection by barbed wire fencing and to overcome the

hurdles with joint effort. The unit of 6 Bigha is taken for convenience of transporting the planting material by one truck in one trip.

Project Outline

A. Unit Cost of 6 Bigha Sugarcane Cultivation

Sl No.	Particulars of Works	Qnty	Unit	Rate(Rs)	Total
I	**Expenditure by the Farmer/Beneficiary**				
1	Land Preparation (Tractor, Roller & cultivator)@ Rs. 300 per bigha/round	24	Round	300	7200.00
2	Cost of FYM	6	Trolly	1000	6000.00
3	Weeding	30	MD	150	4500.00
4	Soil working	30	MD	150	4500.00
5	Cost of Bamboo Fencing	LS			5000.00
	Sub Total:				27200.00
II	**Assistance by MAC**				
6	Cost of Planting Material (Setts)	60	Qntl	320	19200.00
7	**Cost of Transportation from SRS, Bura Likson, Dergaon including Truck Fare, Boat fare, loading and unloading complete up to the field**	-	-	-	22500.00
8	**Cost of Fertilizers**				0.00
8.1	Urea @ 40 Kg per Bigha	10	Kg	240	2400.00
8.2	SSP @ 60 Kg per Bigha	10	Kg	360	3600.00
8.3	MOP @ 15 Kg per Bigha	18	Kg	180	3240.00
9	Pesticides: Diuron 4 Kg. per ha. Monocrotophos 1 lit. Bavistin 500gm	LS	LS	LS	1000.00
10	5 HP Pump Set for Irrigation				30500.00
	Subtotal:				82440.00
11	**Add 1% Contingency**				824.40
	Total				83264.40
	Grand Total (I+II)				110464.40
	Beneficiary's contribution				27200.00
	MAC's Assistance				83264.40

Sd/- **Sd/-** **Sd/-**

Principal Secretary
Mising Autonomous Council

District Agriculture Officer
Lakhimpur District

Planning Officer
Mising Autonomou Council