

FIELD TRIAL OF TWO PROMISING CASTOR GENOTYPES FOR ERI SILKWOM, *SAMIA RICINI* (DONOVAN) REARING

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ABSTRACT: A study was made to evaluate promising genotype of castor for eri silkworm, *Samia ricini* (Donovan) rearing. Finally, two accessions Acc.003 and Acc 004 showed an average of 344.70 g and 334.50 g of leaf biomass/plant respectively and the yield was stable in three conjugative years. However to study its performance in different geographical zones the field trial was conducted in four locations Mangaldoi, Lakhimpur, Kokrajhar and Diphu of Assam in the North East Region of India. In the field study both the varieties showed conformity with institute's result.

KEY WORDS: Castor, Eri silkworm, locations, field trial.

The North East region of India is surrounded by the Himalayan ranges and flanked by the river Brahmaputra and Barak valleys. The region lies between 22–29° N latitude and 90–97° E longitude with a geographical area of 2.55 lakhs km². The altitude varies from 30 to 4500 m in different parts of the region. Many parts of the region are geographically different with foothills to marshy lands, dry lands, urban and flood affected areas. The state experiences a very hot-humid weather during summer with an average temperature of 30 °C (7–38.5 °C). The annual rainfall ranges between 1500 and 2600 mm with average moderate humidity (75%). The congenial climate of this region made it as natural reservoir of floral and faunal biodiversity. Eri-silkworm *Samia ricini* (Donovan) is multivoltine and polyphagous in nature feeding on a number of host plants namely Castor, *Ricinus communis* L.; Kesseru, *Heteropanax fragrans* (Roxb.) Seem; Tapioca, *Manihot esculanta* Crantz; Korha, *Sapium eugeniifolium* Buch-Ham; Payam, *Evodia flaxinifolia* Hook; Borpat, *Ailanthus grandis* Prain; Borkesseru, *Ailanthus excelsa* Roxb; Gulancha, *Plumeria acutifolia* (Poir); Papaya, *Carica papaya*; Bangali era, *Jetropa curacus* L. and several others (Sarmah, 2005). Castor (*Ricinus communis* L.) is an economically important plant for production of industrial oil as well as used as primary food plant for rearing of eri silkworm, *Samia ricini* (Donovan). A total 72 accessions of castor were maintained at CMER&TI, Lahdoigarh, collected from different parts of North East India under NATP programme. The accessions were characterized based on descriptor and 7 promising accessions viz., Acc 003, Acc 004, Acc 011, Acc 020, Acc 030, Acc, 036, Acc 056 were preliminarily selected on the basis of higher leaf yield (Gogoi, 2006). The biomass yield of seven selected castor accessions were studied to find out a promising castor genotype in terms of growth and biomass yield, nutrient status, disease and pest resistant together with eri silkworm rearing performance and compared with control Acc 001. During the study the accessions, Acc.003 and Acc 004 yielded an average of 344.70 g and

334.50 g of leaf biomass/plant respectively and the yield was stable in three conjugative years (Sarmah *et al.*, 2011). Further, to study its performance in different geographical zones a field trial was conducted during 2010-11 in four locations Mangaldoi, Lakhimpur, Kokrajhar and Diphu of North East Region of India.

MATERIALS AND METHODS

The accessions Acc-003 and Acc-004 which has been evaluated as promising castor genotype were utilized for filed trial. 40 nos. of plants were raised from each accession with 3 replications following standard Package of Practices (Sarmah, 2004) at 4 (four) locations *viz.*, Mangaldoi, Lakhimpur, Kokrajhar and Diphu.

PLANTING PROCEDURE

Land preparation

Land was pulverized by 2-3 times ploughing and cross ploughing to a depth of 20-25 cm and leveled for facilitating good root penetration and easy weeding.

Spacing

For sowing of seeds, pits of 20x25x25cm size were prepared maintaining 1x1m spacing. In each pit, 1 kg FYM was added as basal dose and incorporated with soil.

Seed sowing

Two seeds per pit at a depth of 2.5–3.0 cm were sown. Only one healthy seedling per pit was allowed for vigorous growth after germination.

Application of fertilizer

Chemical fertilizer NPK @ 90:40:20 kg /hectare was applied as 1st dose of fertilizer after completion of one month of the germination of the seeds. As 2nd dose, 30 kg nitrogen/ha was applied after attaining the age of three months.

Weeding & inter-culture operation

Ploughing, hoeing, weeding, *etc.* was carried out timely after and before application of fertilizer for healthy growth and better leaf yield.

Growth parameters

The all growth data were collected from centrally located plants by plants of avoiding boardering area of the experimental plantation.

1. Plant height (cm) up to spike
2. No. of branches/plant at mature stage
3. Internodal distance (cm) measurement at mature stage
4. No. of node on main stem mature stage
5. No. of leaf at each harvest time
6. Leaf yield/plant (kg) after 2.5-3.0 months of plantation at 4 seasons at February, March, May, June.
7. Seed yield/plant (g) at 1 season.

RESULTS

The plant height was recorded 0.942 m. in the institute's showed the range of 0.98m to 1.11 m in field study, with less deviation of result. Likewise the internodal distance was ranging from 0.36 cm to 0.42 cm in field trial in relation to 0.38 in institute observation. Other data such as number of node, number of branch, seed yield data of field trial was att par with institute data. Most

important data leaf biomass yield was ranging from 335.00 g in Acc 003 and 326.67 g in Acc 004 field trial was at par with institute observation i.e., 344.70 g and 334.50 g of leaf biomass/plant respectively in both the accessions.

DISCUSSION

During field study in four different geographical locations different growth parameters like Plant height, No. of branches, Internodal distance, No. of node, No. of leaf and Leaf yield/plant were recorded at 4 seasons at February, March, May, June showed less variation with institute's result. Like wise Seed yield/plant was also at par with institute result.

CONCLUSION

From the overall study it may be concluded that the both variety Acc 003 and Acc 004 may be recommended for commercial exploitation.

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Figure 1. Experimental plot of field trial of castor accessions.

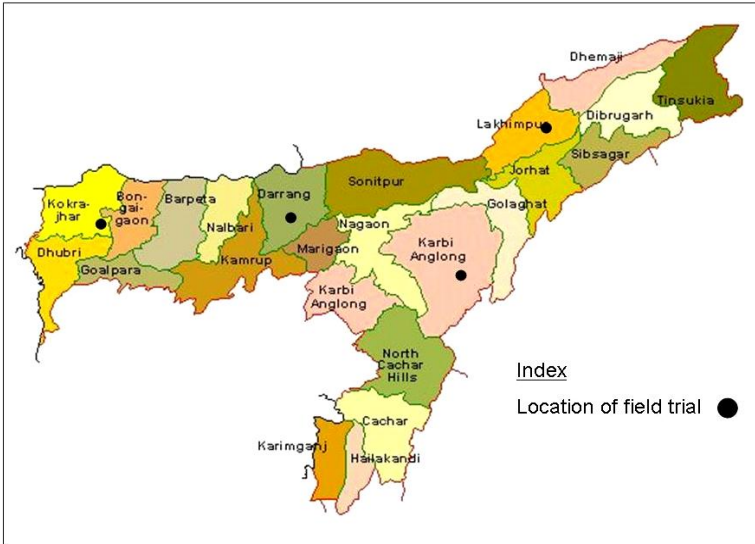


Figure 2. Map showing four locations of field trial in Assam.



Figure 3. Eri silkworm feeding on castor leaves.

Table 1. Growth parameters of castor varieties in the field trial.

Castor Acc.	Plant height (m)	Internodal distance (cm)	No. of node	No of Branch	No. of leaf	Seed yield/ plant (g)	Leaf biomass/plant /harvestyear (Av. 4 harvest) (g)
Mangaldai, Darang, Assam							
Acc-003	1.01	0.38	24.33	3	32.67	56.67	340.33
Acc-004	1.11	0.40	25.00	2.67	31.00	53.00	326.67
Diphu, Karbi Anlong, Assam							
Acc-003	1.09	0.41	26.33	3	34.00	60.67	354.33
Acc-004	1.14	0.42	26	3	30.67	51.33	328.33
Lakhimpur, North Lakhimpur, Assam							
Acc-003	0.96	0.36	22.67	2.67	31.33	53.33	341.67
Acc-004	1.10	0.39	25.67	3.33	32.67	53.67	328.33
Kokrajhar, BTAD, Assam							
Acc-003	1.07	0.38	25.67	3	33	52.33	335.00
Acc-004	0.98	0.39	25.33	3.33	31.67	51.67	332.33
Institute's data							
Acc 003	0.942	0.38	24.17	4.83	31.83	53.67	344.70
Acc 004	1.05	0.37	27.00	3.00	25.83	35.00	334.50
Mean	1.05	0.39	25.22	3.18	31.47	52.13	336.62
Standard Error	0.02	0.01	0.39	0.20	0.70	2.09	2.75
St.Deviation	0.07	0.02	1.24	0.62	2.22	6.62	8.69
Confidence Level(95.0%)	0.05	0.01	0.89	0.44	1.59	4.74	6.22