



C-2038



Tr-23

Nutritional status of different mulberry varieties/genotypes

Mulberry Variety	Leaf Moisture (%)	Soluble Protein (mg g ⁻¹ fr. Wt.)	Soluble Sugar (mg g ⁻¹ fr. Wt.)
S-1	82.75	32.00	34.27
S-1635	79.58	31.28	33.76
Tr-10	76.30	23.46	25.30
BC ₂ 59	76.62	21.29	28.16
C-1730	80.97	34.40	35.62
C-2028	77.23	22.25	24.83
C-2038	79.93	31.44	37.41
Tr-23	79.87	24.80	31.42

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MULBERRY VARIETIES SUITABLE FOR EASTERN AND NORTH EASTERN INDIA



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CSR&TI, Berhampore is established in the year 1943 to provide research and technology support for overall promotion of silk industry in Eastern and North Eastern (NE) India. In E&NE India, mulberry is cultivated over an area of 34,472 ha producing 2158.70 mt of raw silk accounting for 13.23% of national mulberry raw silk production, whereas West Bengal, being the major silk producing state, contributes 86.39% to raw silk production of the region. This region is endowed with a very wide range of agro-climatic conditions in respects of soil texture, nature and fertility status, prevalent temperature and humidity, rainfall, number of rainy days, etc. Mulberry foliage is considered as a crucial component in silk production. A sincere, well planned, concerted and consistent effort by this Institute resulted in development of several genotypes/varieties with high foliage productivity and quality suitable for different agro-climates of this region. **Major characters of different agro climatic areas of this region, improved mulberry varieties under cultivation and impact on leaf productivity** as compared to available varieties are detailed as under.

Indo-Gangetic irrigated plains:

This area is characterized by deep, alluvial loamy soil with neutral to slightly alkaline pH. High temperature in summer (>35°C) and low temperature in winter (<13°C) restricts mulberry growth. High precipitation (>1000 mm/annum) more or less well distributed over the year and easy availability of ground water makes the land highly productive. The area covers Malda, Murshidabad, parts of Nadia and Birbhum districts of West Bengal. The varieties S-1 (Mandalaya) and S-1635 remain suited to these conditions.

S-1 (Mandalaya)



Origin : It is a popular variety of mulberry. The seeds were collected from Mandalaya (Myanmar/Burma) and seedlings raised at CSR&TI, Berhampore, West Bengal. It is selected from OPH seeds and name given S-1 (Selection-1). The variety was widely tested under AICEM both under **irrigated and rain fed conditions** and found suitable for silkworm rearing.

Plant Type : Erect, bushes open type, branches greenish-grey in colour.

Leaf : Leaves simple, entire, spirally arranged, ovate, dark green, smooth and shining.

Ploidy status : Diploid (2n=28); Sex- Male, female, bisexual

Days to sprout- 8; Rooting - 85-90%

Leaf Moisture- 78-79 %; Sugar- 34.27 mg g⁻¹ fr.wt.; Protein- 32.00 mg g⁻¹ fr.wt.

Leaf yield : In irrigated condition 28-29 mt/ha/year & 16-18 mt/ha/year in rain fed condition.

Acreage covered in Eastern and North-Eastern regions: 6,153 ha

Brushing capacity : 2000 - 2500 dfls./ha/year.

S-1635



Origin: Another popular variety of mulberry. It is selected from seedlings of open pollinated seeds, collected from the mother plant CSRS-I at CSR&TI, Berhampore, West Bengal. The variety was widely tested under AICEM and found suitable for high temperature and **irrigated red & black soils** of Karnataka, Andhra Pradesh, Tamil Nadu, Kerala and Maharashtra. It also performs well in Central India, West Bengal, Bihar and Assam (**irrigated condition**). **It has been authorized as National Check variety in AICEM-II.**

Plant Type: Erect, branches straight, greenish-brown in colour

Leaf: The leaves are rough and green with serrate margin, stipulate base and having acute apex.

Ploidy status: Triploid (3n=42);

Days to sprout- 6-8; Rooting - 80%;

Leaf Moisture - 79.58 %

Sugar - 33.76 mg g⁻¹ fr.wt.; Protein - 31.28 mg g⁻¹ fr.wt.;

Leaf yield: 44 - 45 mt/ha/year

Acreage covered in Eastern and North-Eastern regions: 14,863 ha

Increase in leaf yield over S-1 = 56.9%

Brushing capacity: 3300 - 3700 dfls./ha/ year.

Acidic soils of hills and foot hills:

This area is characterized with brown forest soil, sandy to clay loam in texture and acidic in nature (pH 4.0 to 5.8). Very low temperature in winter ($<5^{\circ}\text{C}$) restricts the sericultural operations in that area. Though annual precipitation is high (1559.80 mm), but it is unevenly distributed in 3-4 months creating water deficient in non-rainy period. Due to above reasons nutrient availability to the plants is hampered and leaf productivity suffers. The districts of North Dinajpur, South Dinajpur, Jalpaiguri, Darjeeling and Coochbehar of West Bengal come under this area. Varieties Tr-10 and BC259 are more suited to these areas.

Tr-10



Origin: It is an improved variety developed at CSR&TI, Berhampore, West Bengal by crossing of tetraploid mother (T-4 of S-1) with a diploid male parent Philippine (2n). The variety was tested and authorized under AICEM for **Eastern hills (rain fed)**, Central India, Doon valley and Himachal Pradesh

Plant Type: The plant is erect, stem dark brown

Leaf: Leaves are entire with green colour
Ploidy status: Triploid (3n=42); Days to sprout- 8

Leaf Moisture – 76.30%; Rooting - 70 - 75%

Sugar – 23.46 mg g⁻¹ fr.wt.; **Protein** – 25.30 mg g⁻¹ fr.wt.;

Leaf yield: 14-15 mt/ha/year

Acreage covered in Eastern and North-Eastern regions: 21ha

Brushing capacity: 1000 - 1100 dfls./ha/ year.

BC₂59



Origin: It is an improved variety developed at CSR&TI, Berhampore, West Bengal. It was developed through back crossing of female plant (*Morus indica* Var. Matigara × Kosen) with recurrent parent Kosen. Its performance was confirmed in the AICEM trial and authorized for **hilly Eastern areas (rain fed)**. The variety is good for bivoltine silkworm rearing.

Plant Type: Erect, with side branches spreading type. Mature branches grey in colour.

Leaf: Leaves simple, entire, spirally arranged, broadly ovate, dark green in colour.

Ploidy level: Diploid (2n=28); Days to sprout- 12-15; Rooting % - 60-70

Leaf Moisture - 76.62%; **Sugar** - 28.16 mg g⁻¹ fr.wt.;

Protein - 21.29 mg g⁻¹ fr.wt.

Leaf yield: 9-10 mt/ha/year at hills (Kalimpong) and 15-16 mt/ha/year at foot hills (DOS, Matigara, Siliguri).

Acreage covered in Eastern and North-Eastern regions: 1,323 ha

Increase in leaf yield over Tr-10 = 12.58%

Brushing capacity: 1100 - 1200 dfls./ha/ year.

Rainfed, water stress and laterite soils:

The area is characterized by the presence of red lateritic soil, sandy to sandy loam in texture. Extremely high temperature during summer ($>42^{\circ}\text{C}$) and poor rainfall (<450 mm) are the real problems of this area with slightly acidic (5.4 - 6.6) pH. This renders vast area of the zone to fall under rainfed sericulture which has not so far been profitable. Development of efficient mulberry varieties suitable for the zone is a prominent thrust area. The districts of Purulia, Bankura, Midnapur, parts of Birbhum of West Bengal, Jharkhand, Madhya Pradesh and Orissa come under this area. Variety C-1730 is recommended for these conditions.

C-1730



Origin: It is an improved mulberry developed at CSR&TI, Berhampore, West Bengal. It was evolved by crossing with a tetraploid mother (T-25) and a diploid male parent (S-162). The variety was tested under multi-locational trial and found suitable for rainfed and laterite soil of West Bengal, Orissa and Madhya Pradesh. **The variety was tested under AICEM for confirmation of its suitability.**

Plant Type: Erect, branches straight, stem brown in colour.

Leaf: The leaves are thick, green, serrate margin and acute apex.

Ploidy level: Triploid. (3n=42)

Days to sprout- 7-9; **Rooting -** 85.71%;

Leaf Moisture—80.97%

Sugar – 35.62 mg g⁻¹ fr.wt.; **Protein** – 34.40 mg g⁻¹ fr.wt.

Leaf yield: 15–16 mt/ha/year

Acreage covered in Eastern and North-Eastern regions: 909 ha

Increase in leaf yield over S-1 = 47.88%

Brushing capacity: 1200 - 1400 dfls./ha/ year.

Flood prone areas:

Mulberry generally thrives well in well drained aerated soils. Stagnation of water for longer periods causes early senescence, reduction in leaf yield and deterioration in leaf quality. In extreme cases, the plants die. The major silk producing districts of West Bengal viz., Malda, Murshidabad and Birbhum, adjacent areas in Bihar and adjoining states are often inundated by flood water from the river Ganges, its tributaries and other rivers causing water stagnation for 30-35 days. Variety C-2028 is suited to these areas.

C-2028



Origin: It is an improved mulberry developed by conventional crossing between China White x S-1532. Frequent inundation of mulberry crops in long stagnated flood water in major silk producing areas of West Bengal is a matter of concern as it affects both the leaf quality and quantity. C-2028 is suitable for water logged condition and may be exploited commercially.

Plant Type: Erect, side branches spreading, stem brown in colour.

Leaf: Simple, entire, spirally arranged, broadly ovate, glossy, green, smooth and shining.

Ploidy level: Diploid. (2n=28); **Days to sprout-** 9-10; **Rooting % -** 78

Leaf Moisture—77.23%; **Sugar** – 24.83 mg g⁻¹ fr.wt.;

Protein – 22.25 mg g⁻¹ fr.wt.

Leaf yield: 35–36 mt/ha/year.

Increase in leaf yield over S-1 = 11.35%

Acreage covered: Popularization of the variety just initiated

Brushing capacity: 2700 - 2900 dfls./ha/year.

Special Characteristics- Higher Abscisic acid and cytokinin content indicating this genotype is tolerant to flood condition.

Pipeline Mulberry Genotypes

Mulberry Genotype	Leaf yield (mt/ha/year)	Suitable for	Remarks
C-2088	54 - 55	Indo-Gangetic irrigated plains	Under AICEM (III)
Tr-23	14 - 15 for hills 24 - 25 for foot hills	Acidic soils of hills and foot hills	Under AICEM (III)