

Arka Neelachal Akshay – A high yielding variety of rose apple

Arka Neelachal Akshay, a high yielding variety of rose apple, has been developed through seedling selection at the Central Horticultural Experiment Station (ICAR-IIHR), Bhubaneswar, Odisha and released by the ICAR-Indian Institute of Horticultural Research, Bengaluru, Karnataka. The variety is characterized under early fruit maturation group (March–April), with higher fruit weight (30.2 ± 3.6 g), yield potential (10-12 kg/tree), pulp content (77.5%) and TSS ($14-15^\circ$ Brix). Moreover, the variety is almost free from fruit fly and major diseases.

ROSE apple [*Syzygium jambos* L. (Alston)] is an evergreen medium-sized tree adapted well under tropical climatic conditions. It is native to the South East Asia, however well naturalized in tropical regions of India and Sri Lanka. Rose apple is commonly known as *Jambu*, *Plum rose*, *Malay apple* and *Malabar plum* at different places and considered as one of the underutilized tropical fruits of India. This is mainly grown as a backyard fruit in Kerala, Tamil Nadu, Karnataka, and Odisha. Rose apple has a great market potential owing to its fruit quality and typical rose aroma. It can be a viable option for diversification and value addition in fruit crops provided improved varieties, quality planting materials and scientific cultivation practices are available.

Arka Neelachal Akshay, a high yielding variety of rose apple, has been developed through seedling selection at Central Horticultural Experiment Station (ICAR-IIHR), Bhubaneswar, Odisha. The variety has been released by the ICAR-Indian Institute of Horticultural Research, Bengaluru, Karnataka on the basis of its quality, drought tolerance and market potential.

It is an early maturing variety as fruit ripening occurs in March-April. Flowering starts in December

and continues till January. Flower appears terminally and axially in a group of 5-9 buds. Fruit maturation is completed in about 85-90 days which is evident with the appearance of bright yellow peel colour. It has fairly large fruit size (30.2 ± 3.2 g) with high yield potential (10-12 kg/plant). Fruit is characterized with high pulp content ($77.5 \pm 2.4\%$), pulp thickness, firm texture, TSS (15° Brix), sugar content ($12.5 \pm 1.0\%$) and intense rose flavour. Fruits contain 1-2 large, unarmoured seeds, lying loose in a slightly fluffy cavity when ripe. It is rich in vitamin C, and mineral contents such as calcium and iron. The variety is almost free from any major disease and fruit fly incidence ($<1.5\%$).

Arka Neelachal Akshay is propagated through air layering with more than 80% success in the month of July–August using IBA @ 1000 ppm. Owing to its polyembryonic nature, it can also be propagated through seeds. More than 4 seedlings may be obtained from one seed, however the average seedlings/seed is more than two. A mother block of Arka Neelachal Akshay has been developed at the Central Horticultural Experiment Station, Bhubaneswar to provide quality planting material to the growers.



Fruits of newly released rose apple variety Arka Neelachal Akshay



Polyembryony in Arka Neelachal Akshay



Flowering in Arka Neelachal Akshay



Fruiting in Arka Neelachal Akshay

Table 1. Features of Arka Neelachal Akshay

Attribute	Description
Flower bearing habit	Cluster of 5-9
Time of flowering	December-January
Time of fruit maturation	March-April
Fruit shape	Spheroid
Fruit size	47.3 mm x 40.5 mm
Fruit weight	30.3±3.6 g
No. of fruits/plant	400-500
Fruit yield (kg/tree)	10-12 kg
Pulp content	77.5±2.4%
Pulp thickness	6.0±0.2 mm
Pulp texture	Firm
Avg. no. of seeds/fruit	1.8
No. of seedlings/seed	2.2 (Polyembryonic)
Total soluble solids (TSS)	15.0±1.2
Sugar content	12-13%
Acidity	0.16%
TSS/acid ratio	80-90
Vitamin C	48 mg/100 g
Calcium content	1.24%
Iron content	44.5 mg/kg
Fruit fly incidence	1.48±0.30%



Grade A fruits of Arka Neelachal Akshay

The variety starts giving fruits after three years of planting, however economic yield is obtained after five years. A spacing of 6 m × 7 m (238 plants/ha) may be opted for new plantation, however high density planting system with the spacing of 5 m × 5 m (400 plants/ha) may also be adopted by following annual pruning in the month of May-June. The variety has low input requirement, however application of N, P and K @ 500, 300 and 600 g/plant/year, respectively in two splits i.e. October-November and January-February ensures better yield and fruit quality. The variety can thrive well under moisture-stress condition; however, fruit size gets increased if soil moisture is maintained during fruit development (January-February). The distinctive trait of Arka Neelachal Akshay is that it is almost free from major diseases and fruit fly, the major pest of rose apple. Ripening starts in the mid of March and continues till mid-April. Harvesting should be done with care as fruits are prone to bruising. Fruits may be graded on the basis of size for higher market price. Fruits weighing > 30 g may be considered as Grade A; whereas fruit with weight between 25-30 g may be considered as Grade B. Fruits may be stored at 10-12 °C for 8-10 days.

The cultivation of Arka Neelachal Akshay may be highly profitable if it is carried out following scientific production technologies. The establishment cost of the orchard may be around ₹ 50000/ha, whereas the cost of cultivation of well grown bearing plants may be ₹ 70000/ha. Fruit yield of 3-4 t/ha/annum may be easily obtained with tentative income of ₹ 3.0 lakh. Thus a benefit of ₹ 2.00 lakh may be earned from one hectare plantation of this variety.



Mother block of Arka Neelachal Akshay at CHES, Bhubaneswar

Table 2. Economics of Arka Neelachal Akshay

Particular	Detail
Cost of Orchard establishment (400 plants/ha)	₹ 50000 – 60000.00
Cost of cultivation (nutrient, pruning, plant protection measures, irrigation, harvesting, etc.)	₹ 70000.00/year
Fruit yield	3.5-4.0 t/ha
Income (@ ₹ 80/kg)	₹ 2.80–3.00 lakh
Benefit (₹ lakh/ha)	₹ 2.00–2.20
Benefit cost ratio	2.9–3.1

SUMMARY

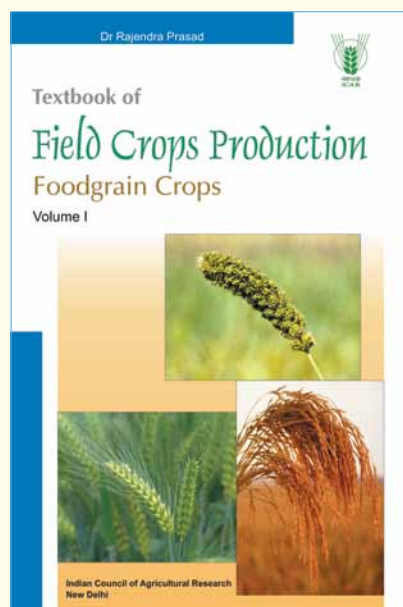
Commercial exploitation of underutilized fruit species is need of the hour for crop diversification as well as increasing fruit basket. In this endeavour, tapping the potential of important minor fruit crops and effective management of their genetic resources seems promising. Rose apple is one of such potential underutilized fruit crops with high market value. However, due to the unavailability of improved variety and quality planting

materials, its cultivation is restricted to selected localities and in backyard plantation. Development of a high yielding variety of rose apple (Arka Neelachal Akshay) will be helpful in enhancing the area under cultivation as well as its commercial exploitation through production of quality planting materials by the Centre. Arka Neelachal Akshay has the potential to become viable options for crop diversification due to fruit quality and higher yield. The variety has ability to thrive well in the moisture stress condition and thus can be cultivated in semi-arid regions, marginal uplands and problematic soils. Therefore, considering the possible inevitable impact of climate change on production efficiency of major fruits, underutilized fruit crop like rose apple (Arka Neelachal Akshay) may be an economically viable option for the fruit growers in tropical regions.

For further interaction, please write to:

Kundan Kishore (Principal Scientist), Central Horticultural Experiment Station (ICAR-IIHR), Aiginia, Bhubaneswar, Odisha 751 019. *Corresponding author email: kkhort12@gmail.com

Textbook of *Field Crops Production* – Foodgrain Crops



(Volume I)

The first edition of Textbook of Field Crops Production was published in 2002 and there has been a heavy demand for the book. This book is now being brought out in two volumes. The chapters cover emerging trends in crop production such as System of Rice Intensification (SRI), export quality assurance in the production technology of commodities like Basmati rice, organic farming, resource conservation technologies, herbicide management etc. Good agronomic practices must judiciously inter-mix the applications of soil and plant sciences to produce food, feed, fuel, fibre, and of late nutraceuticals while ensuring sustainability of the system in as much possible environment and eco-friendly manner. The advent of hydroponics, precision farming, bio-sensors, fertigation, landscaping, application of ICT, GPS and GIS tools, micro-irrigation etc. is in the horizon. The textbook covers both the fundamentals of the subject and at the same time inspire and prepare both teachers and students for the emerging frontiers.

TECHNICAL SPECIFICATIONS

No. of pages : i-xii + 396 • Price : ₹ 700 • Postage : Rs 100 • ISBN No. : 978-81-7164-116-1

For obtaining copies, please contact:

Business Manager

Directorate of Knowledge Management in Agriculture
Krishi Anusandhan Bhavan-I, Pusa, New Delhi 110 012
Tel : 011-25843657, Fax 91-11-25841282; e-mail : bmicar@gmail.com