



Agroforestry Facts  
Goose Berry



<b>Botanical Name</b>	<b><i>Phyllanthus emblica</i> L.</b>
Name in English	Goose berry
Name in Kannada	Nellikaayi
Family	Phyllanthaceae
Seeds Collection	Seeds are extracted by drying the ripe fruits collected during January until they burst with cracking sound when the seeds come out. Seeds have very short viability. 80 to 85 kgs. Of fruits give 1 kg of seeds.
Seeds Processing & Treatment	Seed treatment: 100-500 ppm GA3, (gibberellic acid) 100 ppm kinetin, 1% thiourea, 0.5-1% potassium nitrate, VAM (vesicular arbuscularmicorrhizal) fungi, Azospirillum brasiliense, Azotobacter chroococcum, and Trichoderma viride
Nursery	Seedlings, Grafts and Buddings are used for planting. Seed and vegetative propagation is feasible. Seed propagation results in a heterogeneous population bearing small-size fruits. Natural regeneration in forests continues through seeds. Orchards are raised with grafted or budded plants. Ripe fruits collected in December-February are sun dried until they release seeds, which are floated in water to discard floaters and are utilized for raising rootstock. Germination(35-50%)



	<p>starts within 20 days and is complete in 40 days after sowing. Seeds treated with 100-500 ppm GA<sub>3</sub>, (gibberellic acid) 100 ppm kinetin, 1% thiourea, 0.5-1% potassium nitrate, VAM (vesicular arbuscular mycorrhizal) fungi, Azospirillum brasilens, Azotobacter chroococcum, and Trichoderma viride exhibit enhanced germination (70-93%), seedling growth, and vigor. Seeds are sown in March-April in raised beds or polyethylene tubes/bags. Seedlings that are 6-12 months old are grafted or budded. Pesticide-treated seeds (8-10% moisture) packed in a cloth bag can be stored for 2 months under ambient conditions and for 24 months in 700-gauge polyethylene bags at 5°C.</p> <p>Vegetative propagation through budding (patch, shield, ring, eye, T), grafting (approach, cleft, wedge, veneer, softwood), and cuttings (softwood or hardwood) is practiced with 60-90% successes. Inarching is impractical due to erect habit and availability of a limited number of shoots. Pencil thick, 8- to 10-cm long scion sticks with four to six activated buds cut from semi-hardwood or softwood branches are good for grafting with 95% success. Scion sticks can be preserved for 5-7 days. Grafting is performed 2-15 cm above the collar region depending on rootstock thickness and age. Pencil-thick shoots of the previous season with four or five plump buds swollen up to 2 mm are suitable for budding. Storing buds even for a day result in poor sprouting (33%). Spring (February-March) and rainy (July-September) seasons sustain successful grafting and budding.</p>
Plantation Management	<p>Amla is a subtropical plant and prefers dry climate. It is a hardy plant and can be grown in variable soil conditions. The crop can tolerate salinity and alkalinity. Irrigate the plants initially for establishment. No irrigation is required during rainy and winter season. Drip irrigation is appropriate which can save water up to 40-45%.</p> <p>Manuring should be done immediately after pruning with FYM kg, NPK – 200-500-200 g per tree.</p> <p>The main branches should be allowed to appear at a height of 0.75-1 m above the ground level. Plants should be trained to modified central leader system. Two to four branches with wide crotch angle, appearing in the opposite directions should be encouraged in early years. During March – April, prune and thin the</p>



	crowded branches to provide maximum fruit bearing area in the tree
Model/Spacing	Planting is done during July-August with a spacing of 6 x 6 m in pits of 1x1m or 1.25 x 1.25m.
Pests, diseases and Management	<p>Stem swelling / bulging can be controlled by proper pruning</p> <p>Prophylactic spray of Mono crotophos 2.0 ml/lit can be sprayed twice at fortnight intervals.</p> <p>Gall caterpillar: young caterpillars bore into the apical portion of the shoot during rainy season and make tunnel. Due to this, apical regrowth is checked, side shoots develop below the gall and subsequent growth in following season is greatly hampered. Cutting off the infected apices and prophylactic spray of systemic insecticide like Dimethoate 0.03 percent will control the pest.</p> <p>Bark eating cater pillar: Damages the stem and branches of grown-up trees by eating the bark. The affected portion should be cleared and few drops of kerosene should be applied in holes to keep this in control.</p> <p>Rust: Rust appears as circular reddish solitary or gregarious on leaves and also on fruits. Spray 0.2 per cent Mancozeb at an interval of 7 to 28 days during July to September.</p>
Plant Rotation	15 – 20 years
Yield	The crop yields about 100 kg/tree annually.
Uses	<p>The fruit is the richest source of vitamin C next to Barbados cherry, containing 20times that of two oranges and 160 times that of apple. The fruit contains higher concentrations of minerals and amino acids (5% alanine,5% lysine, 14% proline, and 8% aspartic and 29% glutamic acids) than apple.</p> <p>Fruit is acidic and cooling, refrigerant, carminative, laxative, alexiteric, antipyretic, and diuretic and an antioxidant and is used in treating diabetes, cough, chronic dysentery, diarrhea, dyspepsia, peptic ulcer, hemorrhage, anemia, jaundice; diseases of the chest, head, heart, reproductive organs; and metabolic and aging disorders.</p> <p>Wood (red, hard, and flexible, undergoes warping and splitting, 720-930 kg/m<sup>3</sup> at 15% moisture) is used for minor construction and for making furniture, implements,</p>



	water-conducting pipes, water clarification; it serves as fuel and as a source of charcoal.
Buyers /Industries	Medicinal and food industry
Harvesting	Amla tree starts bearing after 2 years of planting. The fruits are harvested during February when they become dull greenish yellow from light green. The mature fruits are hard and they do not fall at gentle touch and therefore vigorous shaking is required. Fruits can also be harvested using long bamboo poles attached with hooks. A mature tree of about 10 years will yield 50-70 kg of fruit. The average weight of the fruit is 60-70 g and 1 kg contain about 15-20 fruits. A well-maintained tree yields up to an age of 70 years
Economic Returns	Returns start from 4 <sup>th</sup> year and reaching maximum in the 15 <sup>th</sup> year. Net returns of Rs. 1,52,000/- per ha.
Current Market Rate	Rs. 5 – 30 per kg of fruit