



### 3.43

#### Dynamics of NA-7 aonla under different planting systems in rainfed hot semi-arid conditions

A. K. Singh, Sanjay Singh, D. S. Mishra and P. L. Saroj

Central Horticultural Experiment Station (ICAR-CIAH), Vejalpur, Panchmahals, Gujarat

\* Corresponding Author: [chesvejalpur@gmail.com](mailto:chesvejalpur@gmail.com)

A field trial was carried out to determine the efficacy of different planting systems on yield, quality and economics of NA-7 aonla (*Emblica officinalis* Gaertn) during the years 2013 and 2014 under rainfed hot semi-arid ecosystem of western India which were established through *in-situ* patch budding in 2002. The present study contained 5 planting systems as treatments namely; square, hedgerow, double hedge row, cluster and paired planting systems. Different planting systems significantly influenced the vegetative growth, yield and quality of fruits during both the years of experimentation. The average plant height was recorded highest in double hedgerow system (8.87 m) and the lowest in square system (7.95m), whereas the rootstock (60.52cm), scion girth (58.53cm) and plant spread (7.20m) was measured the maximum in square system of planting. However, these parameters were measured the lowest in double hedgerow followed by hedgerow and cluster planting systems. Results of the study revealed that the mean yield/plant (121.20 kg) was recorded the highest in square, but the yield/ha were recorded the maximum in double hedgerow (284.02q) followed by hedgerow (226.10 q), cluster (197.51 q) and paired (153.77q) and it was the lowest in square system (121.20q). An increase in yield/ha in double hedgerow system over square, paired, cluster, hedgerow system was computed 134.34, 84.70, 43.80 and 25.62 per cent under semi-arid conditions, whereas an increase in yield in double hedgerow, hedgerow, cluster and paired over square systems was recorded 134.34, 121.10, 97.51 and 53.77 per cent purely under rainfed conditions. Among the different planting systems, the square system exhibited better values for physical qualities, whereas chemical attributes like TSS, total sugar, vitamin C and total phenols were observed the highest in double hedgerow followed by hedgerow planting system. The net economic return was computed the highest in double hedgerow (Rs.234020.00) and it was the minimum in square (Rs. 1,01,200.00) system of planting under rainfed hot semi-arid conditions.



### 3.3

#### **Bael: A designer crop for arid and semi-arid region**

**A. K. Singh\*, Sanjay Singh, P. L. Saroj and R. S. Singh**

Central Horticultural Experiment Station (ICAR- CIAH), Vejalpur, Panchmahals (Godhra), Gujarat

\* Corresponding Author: [chesvejalpur@gmail.com](mailto:chesvejalpur@gmail.com)

An extensive exploration was carried out to diversity rich areas of states (Gujarat, Madhya Pradesh, Punjab, Haryana, Uttar Pradesh, Rajasthan, Uttarakhand, NE region etc.) of the country during the years 2003-2017. Till now, a total number of 190 germplasm have been established through *in-situ* patch budding in field gene bank at the Experimental Farm of CHES (ICAR-CIAH), Godhra, Gujarat. Out of which, 57 genotypes attained economic productive phase which was evaluated for their yield and qualitative characters. Genotypes exhibited wide range of variability in terms of yield/ plant during 8<sup>th</sup> year (49.13-75.42 kg), fruit weight (0.75-2.92 kg), fruit length (7.09-22.30 cm), fruit circumference (28.68- 57.10 cm), shell thickness (1.7-3.0 mm), seed number/ fruit (49-270), number of seed sacs (11.47-21.50), seed weight (0.10-0.21g), shell weight (107.82-422.50g) and pulp weight (0.35-2.09 kg), as also of its chemical composition including TSS in pulp (34.30- 41.70<sup>o</sup>Brix), TSS in mucilage (40.15-52.50 <sup>o</sup>Brix), acidity (0.32-0.47%), vitamin C (13.07-21.25 mg/100g), total phenol contents (1692-2470 mg/100g) and total sugar (14.14-17.14%). Among the germplasm, considerable variability with regards to physical composition of fruit *viz.*, pulp (47.34-74.80%), shell (13.00-23.27%), fibre content (2.52-6.17%), mucilage (12.00-15.80%) and seed content (1.42-5.80%) were recorded under dryland conditions of western India. Among the genotypes, wide variation in ripening period was noticed (February to June). All the genotypes acclimatized well and giving satisfactory economic yield in rainfed hot semi-arid conditions of Gujarat. The accessions *viz.*, CHESB-1, CHESB-5 and CHESB-8 were identified promising and released as Goma Yashi, Thar Divya and Thar Neelkanth at institute level, respectively. Planting materials of these varieties are in great demand from different parts of the country. Goma Yashi is very popular among the farmers owing to its suitability for high density and quality of fruits.

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