

Effect of organics and chemicals on germination, growth and graft-take in mango

H.S. YALLESH KUMAR, G.S.K. SWAMY, V.C. KANMADI, PRASADKUMAR AND B.N. SOWMAYA

Accepted : September, 2008

See end of the article for authors' affiliations

Correspondence to:

G.S.K. SWAMY

Department of Pomology,
K.R.C. College of
Horticulture, U.A.S. (D)
Arabhavi, BELGAUM
(KARNATAKA) INDIA

ABSTRACT

An experiment was conducted to know the effect of pre-soaking treatments on germination, growth and graft-take in mango. All the treatments promoted significantly earlier germination when compared with control. The stones pre-treated with Panchagavya 3 per cent recorded significantly lower number of days for the initiation of germination (12.25 days), completion of germination (46.18 days), maximum germination percentage (75.22 %), rootstock diameter (7.35 mm), number of leaves (14.77), highest graft success (76.15 %), graft survival percentage (92.04 %), sprout height (5.96 cm) and number of leaves per graft (17.80). GA₃ at 100 ppm had showed highest germination index (4.46) and rootstock height (36.43cm), which was at par with KNO₃ and water soaking.

Key words : Panchagavya, GA₃, Germination index, Graft-take, Amrit pani.

The mango (*Mangifera indica* L.) is one of the important fruit liked by all sections of people in India. It occupies a pre-eminent place among the fruit crops grown in India. Since mango is highly cross-pollinated crop, there is an enormous variation in the seedlings raised even from the fruits of a single tree. Rootstocks are always seedlings in origin whether they are zygotic/ nucellar. In India particularly monoembryonic non-descriptive seedlings are generally used. The differences in germination and vigour of monoembryonic seedlings are vast, depending upon the location and region, where they are multiplied. In semi-arid regions the mango stones are available during the drier parts of the year (April-June) because of which the germination percentage and vigour in these localities is very low.

The synchronization and rapid seed emergence are the commonly reported benefits of pre-sowing treatments on germination and seedling growth. Gibberellins, cytokinin, thiourea, potassium nitrate and other organics are used to enhance the germination and these have been successfully used for breaking the dormancy (Annon, 1980). The significant enhancement of germination was also noticed in different pre-soaking treatments by Padma and NarayanaReddy (1998), Shalini *et al.* (1999), VenkatRao (2002) and Venkatrao and Reddy (2005) in mango and Reddy and Khan (2001) in Khirni. The better germination per cent of mango stones is the main criterion and strong base for successful grafts. Keeping these points in view, an investigation was conducted to study and enhance the germination, growth and graft parameters by using different pre-soaking treatments like organics and chemicals.

MATERIALS AND METHODS

The present investigation was carried out at the

department of Pomology, Kittur Rani Channamma College of Horticulture Arabhavi, during 2006–2007. A completely randomized design with five replications and eight treatments were employed *viz.* Control, Water soaking (12 hours), KNO₃ 1per cent (10min), GA₃ 100ppm (10min), cow dung (12hours), cow urine (12 hours), Amrit pani (3% for 3hrs) and Panchagavya (3% for 3hrs). Monoembryonic variety of Sindhur mango stones obtained from single lot from a processing unit were washed thoroughly and dipped in water. The stones were washed and spread over ground. After surface drying, the stones were treated with bavistin at one per cent and stones were sown in flat bed as per treatment details. Then rootstocks are transferred to polythene bags after one month of germination. Panchagavya and Amrit pani were prepared as per Pathak and Ram (2004). Germination percentage and vigour index (GVI) was computed using the formula

$$\text{Germination percentage} = \frac{\text{Number of stones germinated}}{\text{Number of stones sown}} \times 100$$

$$\text{GVI} = \frac{x_1}{d_1} + \frac{x_2}{d_2} + \frac{x_3}{d_3} + \dots + \frac{x_n}{d_n}$$

where $x_1, x_2, x_3, \dots, x_n$ are the number of seeds germinated on $d_1, d_2, d_3, \dots, d_n$ days taken for germination, respectively.

The vigorous grown four months old rootstocks in container were selected and top growth was decapitated with sharp knife. Care was taken while selecting the scion material to match the girth of the stock. Necessary plant protection measures were taken to combat the pest problems as and when required. The observations were recorded daily for germination parameters, monthly for