

## Papaya and summer groundnut an eco-friendly system of agro-forestry

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A field experiment was conducted during 2002-03 at Zonal Agricultural Research Station, Mainpuri, C.S. Azad University of Agriculture and Technology, Kanpur. The four summer season genotypes of groundnut *i.e.* D<sub>4</sub>D<sub>8</sub>-10, D<sub>4</sub>D<sub>8</sub>-6, D<sub>4</sub>D<sub>8</sub>-14 (Dh 86) and ICGV 93468 were sown in the interspaces of papaya S-1. The recommended doses of manure and fertilizer were applied to papaya. A uniform dose of N<sub>15</sub>+P<sub>30</sub>+K<sub>45</sub>+gypsum @ 300 kg/ha was given to groundnut at sowing in association of 50 q/ha and 100 q/ha FYM. The pods of summer groundnut harvested by 20.33 q/ha from the interspaces of papaya. Similarly, papaya gave fruits by 102.32 t/ha from the companionship of summer groundnut. The papaya cultivar S-1 and summer groundnut genotype D<sub>4</sub>D<sub>8</sub>-10 (20.88 q/ha) and D<sub>4</sub>D<sub>8</sub>-14 or Dh 86 (21.27 q/ha) displayed the better companionship on Gangetic alluvial soils of U.P.

**Key words :** Melon tree, Interspaces, Association, Companionship, Summer groundnut

Papaya occupies a small area yet its cultivation is spread throughout the South-Western-Semi-Arid-Zone-IV of U.P. because it needs warm climate. It cannot tolerate low temperature. Even though it is adapted to a wide range of soils, it grows best in a loamy group soils. Generally, papaya is planted at 2.5 to 3 meter apart in rows. At younger stage of papaya much place is left unsown between rows. The unplanted place can be used for growing of companion crops. The technology of summer groundnut cultivation was developed and diffused in South-Western-Semi-Arid-Zone-IV of U.P. Varieties of groundnut developed by International Crops Research Institute for the Semi-Arid Tropics, Patancheru, Hyderabad and University of Agricultural Sciences, Dharwad, Karnataka under moisture stress condition were tried under two tier system of agro-forestry with papaya at Zonal Agricultural Research Station, Mainpuri during lean months of summer season. Both enterprises grown under companionship proved remunerative. The main objective of this trial was to increase the area of summer groundnut in conjunction with papaya as a remunerative enterprise on loamy sand and sandy loam soils of catchment area of Ison, Kali and Ganga rivers.

### MATERIALS AND METHODS

A field experiment was conducted during 2002-2003 at Zonal Agricultural Research Station, Mainpuri, C.S. Azad University of Agriculture and Technology, Kanpur. The soil of the experimental site was sandy loam having pH 8.6, organic carbon 0.13%, total nitrogen 0.01% available phosphorus 9.0 kg/ha and available potash 291 kg/ha, therefore, the fertility status of experimental

site was low. The four genotypes of groundnut *i.e.* D<sub>4</sub>D<sub>8</sub>-10, D<sub>4</sub>D<sub>8</sub>-6, D<sub>4</sub>D<sub>8</sub>-14 (Dh 86) and ICGV 93468 were sown in the interspaces of papaya S-1. The recommended doses of manure and fertilizer were applied to papaya. A uniform dose of N<sub>15</sub>+P<sub>30</sub>+K<sub>45</sub>+ gypsum @ 300 kg/ha was given to groundnut at sowing with 50 q/ha and 100 q/ha FYM while 150 kg gypsum/ha applied at planting and 150 kg gypsum/ha broadcasted between the flowering and pegging stage of groundnut. The FYM were applied one month before the seeding of summer groundnut. Papaya was planted in the month of October at the spacing of 2.5 x 2.5 M in rows. The sowing of summer groundnut was done on 15<sup>th</sup> March at 30 cm apart in the interspaces of papaya. Experiment was carried out in three-replicated randomized block design. Under agro-forestry system the plant stand of companion crop of groundnut was adjusted by 72 per cent. The four irrigations were given to summer groundnut. Summer groundnut was harvested on 12<sup>th</sup> June. Groundnut pods dried in tree shade to escape from vulnerable sunrays of hot season. After digging of groundnut a good and deep inter-cultivation was done for papaya and field was sanitized. The important cultural practices were done in papaya as and when required. Papaya fruits plucked when they showed the sign of maturity.

### RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarised under following heads:

#### Performance of summer groundnut genotypes:

The different varieties of summer groundnut gave