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Studies on the performance of different varieties of aonla, pomegranate and annona under sodic soil

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ABSTRACT

Aonla varieties *viz*., BSR-1, Kanchan, NA7, Krishna, Chakkaiya, pomegranate varieities *viz*., Mirdhula, YCD-1, Ganesh, GS 135, Annona varieties *viz*., Mamooth, Balanagar, Atemoya, APK (CS)-1, were planted during 1991 under sodic soil to identify best performing crop and variety. Among the three arid zone fruit crops *viz*., aonla, pomegranate and annona ; the aonla crop recorded higher yield over other two crops. Among the five aonla varieties tested in the experiment, BSR-1 showed outstanding performance by recording higher number of fruits, yield and total soluble solids. It also recorded higher content of proline and total soluble protein in the leaf.

Key words : Sodic soil, Proline and soluble protein

The wasteland area in Tamil Nadu is estimated to be about 2.41 million ha. This includes salt affected, uncultivable and marginal lands, which cannot be brought under any other agricultural crops not only because of problematic marginal soils, but also due to poor under ground water in these areas. There is a tremendous scope for bringing in that salt affected marginal lands under arid zone fruit crops because, most of them are salt tolerant and drought tolerant. However, research on the finding suitable varieties of arid zone fruit crops under this marginal and problem soil is very limited. Hence, research on the feasibility of introducing different varieties of arid zone crops under salt affected soil is very much needed to bring these areas under cultivation. Among the different arid zone crops, pomegranate, annona and aonla are highly suited because of their built-in capacity to withstand salt, heat and drought. Well-established root system of these crops will exploit soil moisture better. They are not only hardy but also can withstand problem soils to some extent and once established can become a long-term source of income to the farmers having problem soils.

Aonla, annona and pomegranate are important fruit crop of arid and semi-arid regions with high nutritive value. Owing to its hardy nature, it comes up well even under neglected conditions. It thrives better under a wide range of pH (6-8.5). There are many released varieties in these crops. Individual variety has got its own yield potential in the normal soil. Among the different varieties available in the each crop the variety which is specifically suitable for the sodic soil is not yet been carried out. Therefore, the present investigation was carried out with following objectives. To assess the growth, flowering and fruiting behaviors, the yield and quality parameters under sodic soils, to identify the crop and varieties best suited for the sodic soils.

MATERIALS AND METHODS

A field experiment was conducted at Anbil Dharmalingam Agricultural College and Research Institute, TNAU, Navallurkuttapattu, Trichy during 2001-2006 in sodic soils with pH 9.15 and EC 0.20 dS/m. Three fruit crops aonla, pomegranate and annona were selected with four varieties except aonla which were five varieties. BSR1, Krishna, Kanchan, NA7 and Chakkaiya varieties of aonla, Mirdhula, YCD-1, Ganesh, GS135 varieties of pomegranate and Mamooth, Balanagar, *Annona atemoya,*APK (CS)-1, varieties of custard apple (*Annona squomosa*) were used for field evaluation. The experiment was conducted in randomized block design with five replications under rainfed conditions. The arid fruit crops were planted during 1997 – 1998. Aonla grafts in each variety were planted in one cubic meter pit with top soil, sand and FYM in equal proportion during October, 1997 at 6m x 6m spacing. Pomegranate layers of 12 months old were planted in two cubic feet pit at spacing of 2.5m x 2.5m. Annona grafts were planted in 2.5cubic feet pit at spacing of 5 x 5m These fruit crops were evaluated for their growth (plant height, stem girth, canopy spread and number of branches), yield, quality and physiology parameters *viz*., proline content and total soluble protein content in leaf at bearing stage from 2001-2006.

RESULTS AND DISCUSSION

The growth, yield, quality and physiological parameters were recoded from 2001-2006. The biometric observation recoded during 2006 is given in Table 1. The result revealed that among the five varieties of aonla BSR-