CHAPTER - I
INTRODUCTION

The coconut (Cocos nucifera L.) belongs to family Arecaceae/Palmae under the class monocotyledons and is native to South East-Asia. It is an important oilseed as well as a plantation crop in India. The palm has been regarded as “KalpaVriksha” (tree of heaven), which gives us livelihood, food, nutrition, health and social security. Coconut oil till date is industry’s primary dollar revenue generator, particular in oil producing countries, by nature of its fatty acid profile, which is rich in lauric acid. It has got antiviral, antimicrobial, antiprotozoal and antibacterial properties particularly beneficial to human health.

India has emerged one of the largest producer of coconut in the world, though only third rank in area (after Indonesia and Philippines) (Ramanathan, 2001). In India, coconut is grown in 2140.50 thousand ha with an annual production of 21665.19 thousand nuts, with productivity of 10122 nuts/ha. Among the major coconut growing states, the production share of Kerala, Tamilnadu and Karnataka is 38.25, 33.77 and 11.09%, respectively. In Gujarat, area under coconut is 31,630 ha with an annual production of 295.03 million nuts and productivity of 9328 nuts/ha (Anon., 2014). Looking district wise area under coconut cultivation in Gujarat, it is clear that the coastal belt of Saurashtra occupies nearly 58.70 per cent of total coconut area and less than 50 per cent is distributed over remaining parts of the state (Anon., 2014).

Cocos is a monotypic genus and there are no wild forms and hence variability exists only within local types or population. Palm is tall, unbranched with a terminal crown of leaves, growing to a height of 20-30 m and lives for 80-100 years. It is not a tree since no true bark, no branches, no cambium or secondary growth areas seen. Radicle is temporary and penetrates soil vertically. Subsequent ones spread horizontally. Adventitious roots are produced from bole, basal 60 cm swollen portion of stem.

Coconut, being a perennial crop, needs much attention in the selection of planting materials during establishments of an orchard or even for homestead garden. Further, being cross-fertilized, it does not breed true and makes the selection of seed nuts and seedlings more difficult. The quality of planting material determines
the ultimate returns from arable crops, particularly from tree crops like coconut. The seedling vigour is highly correlated with adult palm characters, such as less juvenile period, nut yield, and coconut water and copra production (Liyanage and Abeywardena, 1957). In the absence of a viable technology for vegetative method of propagation, coconut is propagated through seeds. If the seed nuts happen to be of poor quality, the new plantation will prove to be uneconomic causing considerable loss of time and money to the grower.

The first and foremost step is the selection of mother palm. The mother palms should be of 25-60 years of age with at least 30-32 fully opened healthy leaves on crown, Shape of crown should be spherical or semi-spherical. Petiole length and stalk of the bunches should be short and strong in nature. Bearing habit should be regular, with at least 80 nuts annual yield during the last 5 years, having medium sized round to oblong nuts (1200 g weight with dried husk). One should avoid drooping crown, de-shaped nut, proximity of cattle shed and compost pit near the palm.

The season of seed nut collection may vary from region to region. Always it is better to collect nuts that had undergone development during rainy season for seed nut purpose. The seed nuts should be collected from February-May with 11-12 months age (full mature), the shape and size should be proper as well as free from any pest and disease infestations. Any type of damage of the nut during harvesting is to be avoided, rather the nuts are to be lowered by ropes only to get an undamaged embryo, Furthermore, presence of water in nut is important indices to be judged by shaking the nuts and getting clear metallic sound on taping.

Storing of nuts is another important step towards quality seedling production. Usually, the seed nuts are stored in open shade for about a month (till the husk becomes dry to facilitate speedy and maximum germination (Thampan, 1981 a). Then they are arranged on the floor of a shed over 7-8 cm thick layer of dry sand with their stalk end up and covered with the sand to prevent drying of nut water. Five layers of nuts can be arranged one over the other. During summer, sprinkling of water is needed to prevent the drying of nut water. In South Indian condition, (Marimuthu and Natarajan, 2005) opined, that to get better quality seedlings, the seed nuts are to be cured for one month in open shade, followed by sand curing for 2 or 3 months.

In Gujarat, the source of planting material for coconut growers are either from various nurseries of state government or Department of horticulture of agricultural universities and to some extent from private nurseries. In general, coconut
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is propagated through seed nut. Selection of seed nuts is importance in coconut as performance of new progeny can be evaluated only after several years of planting. Since coconut is cross-fertilized crop and it does not true breed, selection of seed nuts and raising of seedling is more difficult and it take more time for the germination so, that the pre-sowing treatment of water soaking and thiourea is useful to the early germination and growth of the coconut seedling, that’s useful to farmers for the best quality material to planting of coconut.

The superiority of water soaking treatment with respect to increase the germination percentage might be due to cause for softening of husk and leached out inhibitors from husk (mesocarp), shell (endocarp) and testa evolving the mature kernel (endosperm) for germination. Furthermore, punching may helpful for enter water from thick husk which is responsible for rapid germination.

Thiourea may leads early and better germination. Thiourea also affects the respiration in direction of energy generation and also lower dawn by changing the amount of germination regulators present in the seed. This treatment helped in growth of seedling might be due to stimulatory effect of thiourea for the better performance. This might be the most possible reason for stimulate an immediate cell progeny through cell division and elongation of stem portion and greater leaf length, which ultimately resulting in increase in plant growth.

An attempt has therefore been made, to investigate the “effect of pre-sowing treatments on seed nut germination and seedling growth of coconut (Cocos nucifera L.) cv. T×D.” with following objectives.
1. To know the effect of pre-sowing treatment on the germination of coconut seed nut.
2. To access the effective pre-sowing treatment on the seedling growth of coconut seed nut.
3. To study the effect of pre-sowing treatment on success and survival percentage of coconut seedling.