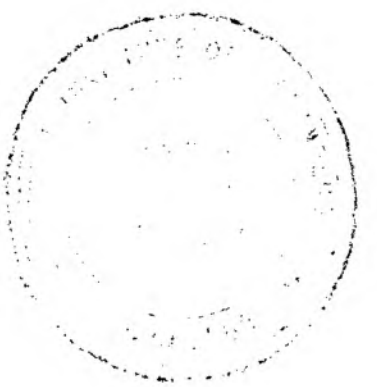
CHAPTER - I

INTRODUCTION



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Jute is one of the most important cash crops of Eastern India. Its products being biodegradable and environment friendly in contrast to synthetic substitutes, a renewed interest in this natural fibre has been generated in the recent past throughout the world. Around 5000 metric tonnes of quality seed is required for sowing about 0.9 million hectare of jute area now under cultivation in India. The majority of this area is confined to *olitorius* jute because of its superior fibre quality and high net return. *Corchorus capsularis*, the only other cultivated species of jute is being fast replaced by the *olitorius* crop even in non - traditional areas to meet the growing market demand of the latter. With the existing average seed production of around 3 quintals per hectare in case of *olitorius* jute, 1.5% of the jute area needs to be allocated for seed production. The earmarked area will, however, be reduced proportionately with the increase in the production potential of seed. Although the fibre quality of the seed crop deteriorates, it still retains some commercial value as raw material for paper, and pulp industries, besides rayon (Ghosh, 1994).

In India, the major jute growing states are West Bengal (56% of total acreage), Bihar, Uttar Pradesh and Assam while seed production is mainly concentrated in the Viderbha region of Maharashtra, Karnataka, Andhra Pradesh and Gujarat. The quality of seed produced, its cost and availability in time at growers' level are generally uncertain resulting in dwindling fibre production of jute. For obvious economic reasons, jute research has revolved particularly around maximising fibre production consistent with quality. Some attempts were made to produce seed in fibre growing areas, but the yield level particularly with respect to *olitorius* was not encouraging. In general, the yield ranged from 2.0. to 3 q/ha as compared to 5 to 9 q/ha in seed producing areas (Saraswat and Pal, 1984).In the recent past, seed production studies in different fibre growing areas spread over varying agroclimatic regions have received momentum (AICRPJAF, 1994). Emphasis was laid on identifying suitable time of sowing and the role of topping under different agro-climatic situations.

Due to prolonged range of flowering period (upto 20 days), the growth and development of pods in *olitorius* shows wide variation in their maturity and seed setting. These variations were narrowed down to a great extent in *capsularis* and majority of the capsules mature under more or less similar conditions (Kar, 1959). This accounts for a lot of variation in the size of seed produced particularly with respect to *olitorius* jute. The differences in seed-size are reflected in the field by lack of uniformity in growth rate of plants (Ghosh and Sen, 1981). Little attention has been drawn to study the impact of this variation in seed size with respect to seed production and its quality.

Since the objective of growing both fibre and seed crop of jute is entirely different, separate strategies regarding nutrient management are warranted to fulfill the goal. In seed crop, the apical domimance needs to be broken to induce more number of pod bearing branches from the dormant branch buds. This is generally done with the help of manual topping of the apical shoot bud. Seed crop, therefore, demands post topping nutrition also, particularly with nitrogen to sustain adequate growth of the newly formed axillary branches for increased setting of pods and their subsequent nourishment. As phosphate (Sawan et al, 1989) and potash (Ghosh, 1983 and Singh et al, 1995) play an important role in the maintenance of seed quality, emphasis on

their enrichment needs to be assured to improve seed yield consistent with quality. These aspects need to be systematically investigated.

In seed crop, unlike fibre crop, wider spacing is desirable to promote the growth of axillary branches (Ghosh, 1983). The crop geometry in seed crop should be so oriented that adequate inter and intra row spacing is available for proper growth of the branches. Poorly developed branches lack in the potential of bearing adequate number of pods and subsequent development of the seeds. Proper manipulation of inter and intra row spacing is thus imperative to enhance the seed production potential consistent with quality.

In seed crop, topping time and its frequency are considered essential to induce the growth of maximum number of effective branches. Improper topping often increases the risk of crop failure. Besides, the recommended practice of manual topping is time consuming, strenuous and costly, thus necessitating an alternate and potent chemical substitute for manual topping.

Growth regulators play a vital role in regulating plant growth via nucleic acid and enzyme synthesis (Overbeek, 1966). Growth promoters like GA_3 at lower concentrations are capable of enhancing vegetative growth through increased meristematic activity due to enhanced cell division and elongation. Gibberellins (GA) also regulate the growth of dormant buds (Salisbury and Ross, 1988), the flowering (Lang and Reinhard, 1968), the fruit set and its rate of growth (Jackson and Coombe, 1966), the fruit ripening (Coggins et al., 1960). In short, GA governs the entire range of developmental stages in plants from dormancy to reproduction and senescence (Leopold and Kriedemann, 1975). Inoculation with Rice necrosis mosaic virus (RNMV) has been reported (Ghosh,1982 and 1995; Bhattacharyya and Ghosh,1992) to act as a growth promoting agent in jute and its impact on quality jute seed production needs to be systematically evaluated. Growth retardant CCC comparatively at a higher concentration, is endowed with the potential of restricting apical dominance thereby increasing stem diameters, chlorophyll accumulation (Gausman et al, 1979) and partitioning of photosynthates to the sink zone and consequently leading to enhanced flowering, fruit retention and seed yield (Sawan et al, 1993). Systematic studies to evaluate the role of growth regulators on seed production of jute and its quality are lacking and need to be attempted to maximise the quality seed production of *olitorius* jute in particular.

Keeping all these aspects in view, an investigation was planned with the following objectives:

1. **To develop a package of agronomic management practices for the production of quality seed.**

2. **To increase the productivity of quality seed under the prevailing agro-climatic conditions in the plains of West Bengal.**