CHAPTER 1

INTRODUCTION
INTRODUCTION

India is mainly an agricultural country and oilseeds occupy an important position in Indian agriculture. Oilseeds are high nutritious food for human and animals. The fatty acids contained in their seeds provide 2.5 times more calories than carbohydrates. In human body fats and oil act as a transport medium for vitamin A, D, E and K (Anonymous, 1993). Some fats especially vegetable oils provide essential fatty acids to human body. The non-edible oils also have many uses in industries, like soap, paint, varnish, hair oil and greases etc. The oil cakes are used as cattle feed and manure.

The main oilseed crops include castor, groundnut, linseed, nigerseed, rapeseed-mustard, safflower, sesame, soybean and sunflower. Palm also contribute to the oil in addition to all these. India has about 19.85 m ha under oilseed cultivation and it ranks first in the world as far as area under groundnut linseed, sesame and niger is concerned and ranks third for rapeseed, the area being 3.73 m ha (Anonymous, 1993).

Ironically speaking, India produces only about 7% of world's edible oil with about 35% of the world's area under oilseed cultivation, to feed about 16% of total world's population (Mobin, 1995). This shortage of oilseeds due to low production has driven the country to the abyss of scarcity. Therefore, to meet the daily requirement, India has to import edible oil every year on large scale which causes burden on our already limited foreign reserves. The per capita requirement of oil is 18 g per day. To meet this
standard India has to produce an additional 9 million tonnes of oilseeds by 2000 AD, which is at present 16 million tonnes. Therefore, enhancement of the oilseeds production is one of the national priorities.

The low production of oilseeds in India is due to several factors. Some of them are listed here: (i) more than 75% of the farmers have small or marginal holdings of less than two hectares (ii) only 15% of the area under oilseed is irrigated as compared to 72% under wheat and 44% under rice (iii) absence in advancement of agricultural techniques for high yielding varieties, post harvest technology and proper processing facilities (iv) attack of pests and diseases as oilseeds are more prone to these. Survival of rapes are extremely intimidated by pests and insects as former attacks the reproductive parts while the latter damages vegetative parts of the plants (v) number of flowers produced are more than pods, only 68% of flowers develops into pods (vi) low temperature influences the flower bud development and thereby lowers the seed yield (vii) internal hormonal imbalance during the sink development (viii) improper source sink relationship.

**Brassica** furnishes commercially important rapeseed which is a member of family Cruciferae. This family has 160 species mostly binnial and annual herbs. Oilseeds brassicas account for approximately 10% of the total world oilseed production. Historically, human consumption of vegetable oil is obtained from **Brassica** spp. and has been primarily concentrated in northern India and China. The cultivation in these countries of **Brassica juncea** (L.) Czern & Coss. dates back to approximately 1500 BC. **Brassica juncea** is well adapted to drier conditions and is relatively fast maturing. On the Indian subcontinent **B. juncea** is the dominant species grown due to its highest content of oil in its seed
For an ideal type of rape, an ideotype postulated by Donald (1968), is of value as it establishes the limits and aims of crop productivity improvement programme. For high yield, a crop should have the following attributes (i) long and flat rosette leaves for rapid ground cover, (ii) few branches, developing simultaneously with the main stem, (iii) little basal branching (iv) early flowering (v) a long seed filling period (vi) improved harvest index (vii) increased pod setting with vertical pod position.

With the limitation in increasing the acreage of cultivation, agriculturists are now focusing mainly on increasing the productivity. Various projects have been undertaken to boost up the productivity of oilseeds. Studies have established a positive role of nutrients in crop growth and development. Along with the increase in the fertility of the soil, the crop should also be manipulated to utilise the available nutrients to the maximum extent or in other words there should be more active sink for the nutrient accumulation. This has led to the option of enhancing the efficacy of the crop for reaping more solar energy with vigorous growth. In this context the phytohormones can thought to be the trendsetter. The phytohormones are known to be actively involved in various physiological activities such as growth, flowering, ion-transport and yield (Wareing and Philips, 1981; Khan, 1996). Uptake and transportation of nutrients are affected by phytohormones as proved by growth chamber and pot culture experiments (Bostrack and Struckmeyer, 1964; Muller and Leopold, 1966; Kannan and Mathew, 1970). These studies are, however, limited to few crops and do not envisage mustard, an important oilseed crop.
Along with the increasing vigour, the plants should be supplied with required amount of balanced fertilisers. Application of large quantities of inorganic fertilisers has its disadvantages too. Beside large scale expenditure of already exhausted foreign reserves for importing the fertilisers on one hand and on the other hand continuous application of one particular nutrient may affect the availability of other nutrients and can also cause pollution hazards.

This has lead to design few field experiments on mustard with the following aims:

1. To select the best phytohormone and its concentration for higher growth, nutrient accumulation, yield and quality characteristics of mustard.

2. To establish the suitable growth stage for foliar spray of the selected phytohormone.

3. To study the effect of the selected phytohormone under varying levels of N, P and K on the performance of the crop.

4. To workout the cost benefit, if any obtained by using the phytohormone in mustard cultivation.