CHAPTER I

INTRODUCTION

The genus Cymbopogon (family - Poaceae) consists of 85 species, widely distributed in tropical and sub-tropical countries. About 26 species are reported to grow in wild state in different parts of India (Thapa et al., 1971). Cymbopogon flexuosus (Nees ex Staud) Wats. var. sikkimensis Bor. is an excellent source of naturally occurring essential oil containing methyl eugenol. Methyl eugenol is used widely in perfume compositions of the carnation type and bouquets of oriental character, apart from serving as a modifier of eugenol (Guenther, 1957). It is primarily used as a raw material for synthesis of methyl dopa - an important hypertensive medicine. The oil also contains α-pinene, camphene, limonene, cineole, β-cymene and linalool which are used in preparation of perfumes (Thapa et al., 1976; Hazarika et al., 1977 and Misra et al., 1985). C. flexuosus var. sikkimensis can be commercially grown in wide range of soils. Preliminary trials at the experimental farm, RRL, Jorhat indicated that its cultivation can also be extended economically in unproductive soils (acidic in reaction). The fact that such type of lands are lying waste to the tune of about 2.35 million hectares in the North-East region of India alone (Anon., 1980-82), economic cultivation of crops like C. flexuosus var. sikkimensis in these areas will open new vistas for their better utilization.

Knowledge on the general nature of plant response to variations in zinc and boron nutritional balance, leads to consider
that these elements are likely to be of importance in determining biomass production, essential oil and its quality in a moderate crop geometry. High or at least adequate plant density produces biomass and essential oils in sufficient quantity. Boron is required for proper development and differentiation of tissue associated with the reproductive phase in plants and functions in cell maturation by regulating the formation and lignification of cell wall. Essential oil content, herbage yield, plant height and number of shoots per plant are also improved by the application of boron. Zinc is helpful in oxidation-reduction reactions in the plants, apart from which it also plays an important role in photosynthesis and nitrogen metabolism.

These are some of the ways in which micronutrients play important role in the production of biomass, economic yield, essential oil and its constituents. The dynamics of the components in the essential oil at different diurnal phases will, therefore, contribute towards exploring the full yield potential.

As will be seen from the subsequent review of the literature, work on the micronutrient requirements of *C. flexuosus* var. sikkimensis had so far not been reported. Hence, the present investigation was undertaken comprising three levels of crop geometry and four levels of each of zinc and boron during 1988-89 and 1989-90 at the experimental farm of Regional Research Laboratory, Jorhat (India).

The main objectives of these studies were to provide information on the cultivation of *C. flexuosus* var. sikkimensis
regarding crop geometry and zinc-boron variable on plant growth, flowering behaviour, yield of biomass and essential oil along with their constituents.