INTRODUCTION

Soybean, *Glycine max* (L.) Merrill, is a leguminous crop which has gained recently an important status among the food crops, especially pulses, due to its rich protein and oil content and high nutritive value. As early as 1956, Chen recognised its nutritive value and stated: "Soybean, rarely recognised as a dietary constituent, is a food that is as nearly perfect as Cow's milk but at the same time rich in iron and vitamin C (when sprouted)." According to Kachroo (1970), soybean contains as high as 43.2% protein and 19.5% fat. The yield of protein from soybean, weight for weight, is approximately twice that of meat, four times that of eggs, wheat and other cereals; five or six times that of bread; twice that of lima, navy beans, walnuts, filberts and most other nuts and twelve times that of milk (Chen, 1956).

World Health Organisation reports often indicated that malnutrition, specially protein deficiency, has been a major problem among the people of developing countries, where the poor usually obtained protein mainly from pulses like tur,
urid, moong and gram. The search for a protein rich crop has been going on for a number of years and has resulted in the discovery of soybean which promises a solution to this problem.

Soybean is largely used for the extraction of oil and is considered as one of the most important economic crop of the country. The residue, de-oiled cake, left after extraction of oil, is still very rich in protein content (43%) and hence provides great scope for supplementing protein dietary requirement of human beings and domestic animals. It is for this reason that soybean cake is being used for cattle feeding. In addition to this, large variety of preparations like soya milk, soya biscuits, soya curd, soya cream, soya flour, soybean nestum etc. are available in the market to supplement protein diet for the mainly vegetarian Indian. Soybean is thus a very important crop promising great scope for eliminating dietary deficiency of protein and fat in the country.

In India, soybean has been grown for centuries as a minor pulse crop in the mountainous northern region and central India (Singh, 1977). Soybean acquired great importance when it was included under item No. 2 of the 20 point programme announced by the then Prime Minister of India in 1982. Since then, the area under its cultivation
has been continuously increasing year after year. Today, in Madhya Pradesh alone, soybean cultivation is touching a proposed target of 38 lakh hectares, producing a total yield of 8 lakh tonnes under the 6th five year plan. This amounts to about eight per cent of the total acreage under soybean cultivation in the whole of the country.

The topography, soil characteristics and climate, including rainfall of Sagar region, provide favourable conditions and encouraged soybean cultivation in the area. According to a report from the State Department of Agriculture, Sagar, the acreage under soybean cultivation in Sagar division during 1983-84 was 19,100 hectares and the yield 42.2 thousand tonnes. Recently, a soybean processing plant, "Sagar Soya Products, Pvt. Ltd.", Sagar has been started in Sagar, which is expected to provide greater impetus for increased soybean cultivation in the region.

A research and development programme in respect of soybean was initiated at Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, Madhya Pradesh, with the collection of indigenous and exotic germplasm in 1965. Later in 1967, it received generous help from United States Agency for International Development and The University of Illinois, U.S.A. under PL - 480 scheme. The research work carried out at Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur and
Govind Ballabh Pant, University of Agriculture and Technology, Pantnagar, Nainital, emphasized the production of new high yielding varieties, in addition to indicating that Indian climate, especially of central India, was favourable for soybean cultivation. Since then, a large number of new varieties of soybean have been bred, and many of these are recommended as "cultivars".

Soybean is mainly a kharif crop but, under irrigated conditions, it is grown in the rabi (December-May) season also. The crop, thus, remains in the field for about 8 to 9 months in a year, including a period which is most congenial for insect growth/population. Soybean naturally provides a dense succulent foliage for insects, not only for habitation but as a ready source of food also. Some of these insects, due to heavy infestation, become serious pests of the crop causing great economic damage to the cultivator. Moreover, earlier cultivation practices used old traditional varieties of soybean of which the yield was low and the crop took a long time to mature. The development of recent high yielding and short duration varieties needed more or less a clock work precision in cultivation, since they tend to be more vulnerable to natural hazards including insect attack than the old varieties.

As far as the author is aware, Pruthi (1969) and Pradhan (1969) have not described any insect pest of soybean
in their books on economic entomology. The literature on
insect pests of soybean elsewhere in India as well as abroad,
is also scanty. In 1971, Ganrade et al. and Kapoor et al.
described *Oberea brevis* Swed. as a serious pest of soybean
in Madhya Pradesh. A preliminary survey study made by the
author revealed that most of the pests ranked abroad as
serious pests of soybean, did not occupy this status in
M.P. possibly due to different cultivation patterns and
agro-climatic conditions. The present problem, "Studies
on Insect pest Complex of Soybean, *Glycine max* (L.) with
reference to Sagar region", was therefore, undertaken specially
with the objects: (i) to investigate the insect calendar
of soybean crop from sowing till harvest; (ii) to study
the nature and extent of damage by different insect pests;
(iii) to assess the effect of pest infestation/insecticides
on the oil and protein content; (iv) to screen out the
soybean varieties for resistance/susceptibility against
insect pests; (v) to investigate the susceptibility
of stored soybean to insect pests and (vi) to make studies
on the chemical control measures in relation to the different
insects of soybean. The present thesis embodies the findings
of these studies and concludes with a discussion of the
results.