INTRODUCTION

The use of plants as medicines is as old as human civilization. The World Health Organization (WHO) has compiled a list of 20,000 medicinal plants used in different parts of the globe. India has been known to be a rich repository of medicinal plants. The Rigveda Yasurveda and Suhrut Sanhita have mentioned 67181 and 290 medicinal species of plants respectively. Later on the “Charak Sanhita” and “Sushrut Sanhita” have described the properties and use of 1100 and 1270 plants, respectively in compounding of drugs and these are still used in classical formulation in the Ayurvedic system of medicines.

Blond psyllium (Plantago ovata Forsk.) commonly known as "Isabgol" is one of the important, medicinal plants and it is widely grown in India for the purpose of manufacturing traditional and modern pharmaceuticals. Now it is a very important and potential plant to generate foreign exchange. The use of plantago seeds in medicines is recorded in Arabian and persian medicines and later found its inclusion in native system of medicines (Karmick, 1976). Thus, the seeds as well as husk of Isabgol has multifarious uses particularly for the digestive organs, dysentery and irritations of the intestinal tract. Decoction is useful in cough and chronic diarrhoea.
The seeds taken in large quantities swell up in contact with water and increase the bulk of the intestinal content. Thus, it relieves chronic constipation by mechanically stimulating the intestinal peristalsis.

Isabgol is the most important plant. Its utility has been well established as medicines among traditional as well as scientific commodities. America is the biggest consumer of isabgol in the world where energy is being produced from the jell (liquid materials) of its seeds which is being used in the large scale in solar research centers. Its use in Arab countries was started from Unani medical system in tenth century. After that it was used in the major Ayurvedic medicines. At present, Isabgol is being supplied to foreign countries worth Rs. 100-120 crores every year. It has got first place in the world in the export of medicinal plants. Its main producer in the world are Iran, Iraq, South Arabia Republic, Amirat, India and Phillipines etc. India has the first place in the production of Isabgol. Because of its higher medicinal importance, World Health Organization has recommended to include Isabgol in the modern medical system. Since it is a crop of arid climate, hence the dependency of India for its supply will remain in future also.

In addition to food materials, Isabgol is also largely used in colour and painting materials etc. Recently, two Indian scientists have developed tissue cultures of commercial importance from the
seeds of Isabgol. At present the tissues are prepared from agar which costs to worth of Rs. 10,500 per kilogram, and for its import crores of rupees per year are expended. Tissues prepared from Isabgol becomes twenty times cheaper than from agar. Tissue culture is the important process of biotechnology. From this, lakhs of plants are prepared from one plant. This process plays an important role in the development of most scarce available plants. Till today due to costly imported agar, preparing plants from tissue culture becomes very costly and its benefits is not reached up to different classes of the society. Use of Isabgol has shown this possible. Tissues prepared form Isabgol is not only cheaper, but the prepared medium remains transparent, whereas such condition does not exist in case of agar. Due to transparency, observation of plant roots has become easier. Isabgol is polysaccharides and colloidly in nature and possess resistant power against the enzymes. Due to these specific reasons, tissues from isabgol are considered most important in the vegetation world. According to the recently published report of Exim Bank pertaining to “Indian Medicinal Plant - A Sector Study”, in previous one decade (1985-1995) which of those medicinal plants recorded considerable increase in their export from India, Isabgol is the first out of them. The international demand from India for husk and seeds of Isabgol has become double up to 16,000 tonnes. It is a good indication for the farmers and traders of Madhya Pradesh. Cultivation
of Isabgol may prove highly profitable on commercial basis due to its use in enough quantities in different medicines. The usefulness of Isabgol has also been observed in some of the testing animals viz. cats, dogs and rabbits with respect to blood pressure and cholesterol level (Khorana et al., 1958, Atal and Kapoor, 1964).

In India Isabgol is being produced in about 50 thousand hectares in major growing state like Gujrat, Punjab, Uttar Pradesh, Rajasthan and Madhya Pradesh. In the whole world, "Isabgol" is traditionally cultivated in North Gujrat only. During 1989-90, it was cultivated on 29891 hectares and produced 20564 tonnes of seeds (Anon, 1990). In later, it has been cultivated in Southern Rajasthan and in scattered areas in state of Madhya Pradesh, Haryana, Punjab in India. It is newly introduced medicinally important commercial crop grown on vertisols of North Western Part of Madhya Pradesh. Isabgol has got first place in the export of medicinal plants from India. Thus, India is the sole exporter of Isabgol to the world market and about 80 to 90% produce is exported. The export of husk and seeds valued to Rs. 4650 and Rs. 6170 million during 1989-90 and 1990-91, respectively.

Due to pressure of intensive cropping with high-yielding crop varieties of agricultural lands and imbalanced as well as indiscriminate use inorganic fertilizers without integration of organic manures, the soil fertility is continuously deteriorating owing to
productivity of crops. High-yielding varieties of Isabgol are heavy feeder and highly responsive to applied fertilizers, therefore it is imperative to determine proper requirement of nitrogen and phosphorous fertilizers to achieve good yields under the existing agroclimatic conditions of Vindhyan plateau zone of Madhya Pradesh.

Growth of crop plants remarkably vary under varying spatial arrangement. Hence, this fields need an urgent study to the productivity of Isabgol suitable plant densities to maximize. Keeping above points in view the present investigation entitled “Evaluation of Isabgol (Plantago ovata Forsk) at different plant densities and fertility levels in Vindhyan plateau of M.P.” was undertaken with the following objectives:

(1) To findout the possibilities of growing Isabgol under agro-ecosystem of Vindhyan plateau of M.P.

(2) To ascertain the appropriate population density (seedrate/ha) and nutrient levels for maximum growth and productivity of Isabgol seed.

(3) To eastimate the economic viability of the crop for up lifting the economic conditions of the farmers of this region.