Chapter I

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Weeds reduce crop yields and elevate farm production costs through energy spent in controlling them. Besides, their negative values are depicted during harvesting, marketing, storage and dockage of weedy crops. Moreover, weeds are responsible for increased insect pests and plant pathogen populations in succeeding years, human and animal health hazards, and menace to the aquatic environment. It has been proved that weeds are more damaging to crops than insect pests and diseases combined (Bendixen, 1972). In India, on an average weeds are noted to incur a loss of 41.6% in yields of rice; 30.5% in soybean; 38.9% in maize; 16% in wheat; 34.2% in linseed and 11.6% in gram (Mani et al. 1968). Unless weed competition is eliminated, it becomes impossible to obtain full yield potential of a high yielding variety even with the application of all other inputs.

The weed menace is more serious in kharif season during which it is very difficult to perform any physical operation in the field. In Madhya Pradesh, perhaps the biggest single factor limiting the crop production is weed competition.
Soybean has become an important kharif crop of Madhya Pradesh. However, the average grain yield of soybean in M.P. as well as in India is very low i.e. 7.43 q ha\(^{-1}\) and 7.57 q ha\(^{-1}\), respectively (Anonymous, 1987) as compared to the average yield potential of this crop which is nearly 25.0 q ha\(^{-1}\). Soybean occupies a large hectarage (nearly 1,04,700 ha) in the district of Hoshangabad which has got nearly 68% deep Vertisols mainly irrigated by Tawa canal system. Heavy weed infestation is the major cause for the lower productivity of soybean (8.85 q ha\(^{-1}\)) in this district. However, negligible attempts has been made to evolve a feasible and adoptable schedule of weed control for this crop under the conditions encountered in deep Vertisols of the district.

Among the different methods of weed control, the physical methods are the oldest and the most practical and efficient. However, these methods are time and labour consuming. Further, an important requirement of the success of a physical method of weed control is timely operation when the weeds are young, but shortage of labour during peak period of weeding, continuous rains and unworkable soil condition hamper physical operation.
Under the situations, when physical weeding is not feasible, particularly in the monsoon season and in controlling the weeds which are spiny or survive by mimicry, herbicides prove very useful. Herbicides vary greatly in their molecular structures, mobility within plants, selectivity, fate in soils and response to environment. However, it is experienced that there is hardly any chemical which controls all types of annual and perennial weeds. Further, they too are expensive, needs costly equipment, great skill and precautions to use them.

Apart from physical and herbicidal control of weeds, biological and electromagnetic methods of weed destruction have also proved highly efficient under some specific situations, but under Indian farming conditions their utility is still impractical.

Looking to the manifold nature of weed problem, an integrated approach is considered the most practical. In the integrated approach more than one method of attacking weeds is applied in a systematic sequence.
Keeping the above facts in view the field investigations entitled "Studies on the effect of cultural and chemical control systems of kharif weeds in Tawa Command Area", were carried out taking soybean as the test crop during 1985, 1986 and 1987 with the following objectives:

1. Identification of different weed species of kharif season in Tawa Command Area.

2. To find out the nature and extent of weed problem in Tawa Command Area.

3. To find out the effect of different herbicides/herbicidal combinations and physical methods of weed control on the intensity and growth of the dominant weed species.

4. To find out the effect of different weed control methods on growth, yield attributing characters and yield of soybean.

5. To evaluate the effectiveness and economy of chemical and cultural methods of weed control in soybean crop.

6. To find out an efficient integrated weed control system for soybean crop in Tawa Command Area.