
INTRODUCTION

I N T R O D U C T I O N

Although the food problem is as old as the annals of history, the period of the last quarter of this century has been one of the most difficult periods that man has experienced. It is not in India alone the food deficit has been seriously realised but in other countries as well. Over the past few years, there has been a series of unusual bad harvests in many countries owing to severe drought. The scientists all over the world are trying in different crops to increase the total yield under adverse conditions, including saline soils. Among the different crops, oil seed covers about 10% area of the total cropped area in India. In the national trade oil seeds occupy third position after Tea and Jute. The capita consumption of oil per annum in different countries is given below :

1) W. germany and Britain	- 24 kg.
2) U.S.A.	- 20 kg.
3) Japan	- 11 kg.
4) India	- 6.6 kg.

These figures indicate the lowest per capita consumption of oil in India. The Government of India is encouraging farmers to cultivate different oil seed crops as these crops have been the backbone of agricultural economy.

Safflower, has been recognised as a crop of economic

importance since many centuries as a source of oil, food fodder and dye. Safflower stands middle position in cultivation among oil seed crops. Generally crop is grown in rabi season under the rainfed area. It has a capacity to adapt to a wide range of climatic and soil conditions. It is a fairly drought resistant crop grown in rainfed area. Safflower is more stable, productive and profitable than any other irrigated rabi crop. Many agronomists have been working with breeding programmes at various research centres in India to release high yielding varieties of safflower. Their performance under various climatic conditions is also studied. Now a days safflower is cultivated mainly for its oil besides oil cake, dye, vegetable etc. The crop is also resistant to saline conditions (Weiss, 1971). All these attempts have been made with respect to yield studies. However the physiological aspects are not clear. Therefore we thought it worthwhile to undertake the physiological studies in the present investigation. We have selected improved safflower variety JLSF-88 because it is superior to NRS-209 and Bhima as far the yield is concerned (Data obtained from Agriculture Research Station, Jalgaon).

Chapter I includes a brief review of safflower. The chapter is divided into three sections. The first section includes all the details of agronomical aspects of safflower.

It is necessary to study the cultivation practices of crop for its general nature of climatic response. The second section gives the idea about the physiological work done on safflower. There are few attempts in this direction as compared to other oil seed crops. The safflower physiology under the water stress and NaCl treatment is not studied well. Eventhough it is a drought resistant, a short period of water stress at the time of heading stage brings about many changes in metabolic processes. The idea of research is explained in the third section under the heading, scope of present investigation.

The methodology followed for the present study is covered under the Chapter II, 'Materials and Methods'. The materials employed for water stress studies and salinity tolerant studies (NaCl treatments) are mentioned separately. The attempts have been made to study different growth parameters, organic constituents like moisture, relative water content (RWC) titratable acid number (TAN) and polyphenols. The estimated inorganic elements are sodium, potassium, calcium, magnesium, iron, copper, zinc, manganese and chlorides by using Flame Photometer and Atomic Absorption Spectrophotometer (Perkin-Elmer Model-3030). The activities of enzyme peroxidase and acid phosphatase are also studied with recent methods.

The Chapter III deals with the results and discussion

in the light of available latest literature. The Chapter includes two sections as 'Water stress studies' and 'Salt tolerance studies'. Each section is studied with respect to growth parameters, organic constituents, inorganic constituents and activities of enzyme peroxidase and acid phosphatase.

The important findings of the present investigation are briefly summarized under the Chapter IV "Summary and Conclusions."

The present study was pursued to have preliminary idea of physiology of safflower under the effect of water stress at the heading stage and effect of NaCl treatment. Hence only the detailed studies will throw more light on the physiology of the safflower. It is admitted here that many more such attempts must be made in other improved varieties of safflower to derive a clear idea about the physiological behaviour.