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Studies on Sensitivity of Safflower Varieties Grown in Marathwada Region by Water Culture Technique.

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Abstract: *Safflower is one of the important rabi oilseed crop grown in Marathwada region which play a vital role in agriculture economy. Various safflower varieties are affected by several diseases like viruses, bacteria, fungi and nematodes at different growth stages of plants. Out of these, fungi like Fusarium wilt caused by Fusarium oxysporum f.sp.carthami is common in in Marathwada region 0fMaharashtra. The fungus grown in vascular tissues and few surrounding cells causing block of vascular system resulting into the browning of tissue, hypersensitive expressions, drooping of leaves, wilting of plant followed by death of plants. Therefo represent study was undertaken to study the sensitivity of some safflower varieties against fusarium wilt grown in Marathwada by water culture technique.*

Keywords: *Fusarium* wilt, wilting of plant, water culture technique

I. INTRODUCTION

Safflower (*Carthamus tinctorius L.*) belongs to family Asteraceae or compositae. A most common name being "Kardi" in Marathwada region .It contains rich sources of protein &highly nutritious edible oil. It contains high percentage of essential polysaturated fatty acid and linoleic acid which help in reduce the risk of heart diseases. Safflower is known to suffer from many fungal and viral diseases. Out of these Fusarium wilt caused by Fusarium oxysporumf.sp.carthami was first reported by Klisewicz and Houston (1962) and proved its pathogenicity on six wild sp of Carthamus.In India *Fusarium* wilt is reported by Singh et al.(1975). The disease shows more or less rapid wilting, browning, drooping and dying of leaves followed by death of whole plant. Wilting occurs as a result of pathogen present in xylem vessels of plant showing hypersensitiveexpression, necrotic and dropping of leaves. If infected plants are alive the pathogen remains in the vascular tissue of the plant.(pedgaonkar& Mayee 1989)Fusarium is a soil borne pathogen and can be survive in soil for up to twenty years (Shabeer et.al.2021).It is seed/soil borne pathogen particularly fungal pathogens affects directly and indirectly the quality and quantity of oilseed crop in terms of deterioration and reduction in oil content, reduction in germination, viability of seed and therefore potential losses in yield.

II. MATERIALS AND METHODS

The water culture technique (WCT) suggested by Nene et.al. (1981) was tried with the optimum concentration of 3.5 per cent cultural filtrate (CF) standardized by Mehetre (1988). Pedgoankar and Mayee (1989) for screening of safflower genotypes against Fusarium wilt. In the present study Six different varieties of safflower viz, PBNS-40 , Sharda, Annagiri-1,PBNS-12,Sarpan and Nari-6 growing in the Marathawada region and in the vicinity of parbhani field were selected for the sensitivity of safflower against fusarium wilt by water culture technique.

The seedling of each varieties were raised on germination paper separatly . Fifteen days old seedling were transplanted to test tube containing 10ml of cultural filtrate (CF) of 3.5 per cent separately. The observation ofSuch symptomatic plants showing visible symptoms such as yellowing, withering, drying of leaves, complete drying of plants, partial wilting and vascular discoloration,drooping of leaves etc. and mortality percentage was recorded.

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III. RESULT AND DISCUSSION

To screen the sensitivity of fusarium wilt 3.5 per cent CF was used by WCT in Six different varieties of safflower growing in Marathwada region. The results indicate that a safflower variety has variable reactions to *Fusarium oxysporiumf.sp.carthami*. In general variation in the mortality percentage (wilting), hypersensitive reactions and drooping of leaves at the end of seven days ranges between 45 to 100 per cent. (Table-1)

Out of these six different varieties like PBNS-12, Sharda, Annagiri-1 shows maximum mortality between (86-100%) while varieties like PBNS-40 shows moderate mortality per centage between (60-70%) and varieties like,Sarpan and Nari-6 shows significantly lowest per cent mortality below (50%).The varieties represents highly susceptible , moderately susceptible . A brown discolouration of vascular tissue causing rotting of root hairs., similar results were obtained by dhakhane (1993) ,pedgoankar and Mayee(1989) and somwanshi (2000). While screening different genotype of safflower by water culture technique observed that most of the genotypes were highly susceptible to Fusarium wilt. This disease is appearing every year in Marathwada region in safflower cultivated area,probably due to contamination of soil/infected soil. It is observed that wilting was simultaneously aggregated by leaf spot diseases caused by *Alternaria carthami* on all the varieties with enormous losses and affecting the productivity of safflower.

Table :1 Sensitivity of some safflower varieties against Fusarium wilt by water culture technique with 3.5 of CF.

Sr. No	Varieties	No. of plant wilted (After 7 days)*	% of wilting*
1	Sharda	9.2	90.2
2	PBNS-40	6.7	67.4
3	Annagiri-1	8.9	89.7
4	PBNS-12	9.0	90.0
5	Sarpan	4.9	49.4
6	Nari-6	4.8	48.6

*Based on ten seedlings of each varieties.

*Mean was calculated of three replicates.

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