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Pest status of safflower, *Carthamus tinctorius* L. in northern parts of Karnataka

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Abstract
Safflower, *Carthamus tinctorius* L. is one of the most important rainfed and draught tolerant oil seed crops of India. Safflower is mainly grown for its edible oil in the semi arid tropics of India. Karnataka is the second largest safflower growing state in India. Safflower is attacked by 36 species of pests in India. To identify the major pests of safflower and natural enemies, roving survey was carried out in Northern parts of Karnataka covering 8 districts during December to January 2007-08. Survey results indicated that in general the pest intensity was more where ever safflower was sown as a sole crop and inter cropped with Bengal gram. Among the cropping pattern, safflower as a sole crop and inter cropped with Niger harbored more aphid when compared to any of the cropping patterns. Safflower caterpillar was noticed in few places especially at Dharwad, Koppal and Gadag districts of Karnataka in the early stage of the crop growth. The capsule borer, *Helicoverpa armigera* (Hubner) pest was recorded in all most all surveyed areas. The natural enemies of both *Chrysoperla carnea (*Stephens) and coccinellids were higher where ever safflower was inter cropped with coriander and sorghum. It can be concluded from the study sole crop harbored more pests and inter cropped with coriander and sorghum conserves the natural enemies.

Key words: *Carthamus tinctorious - Helicoverpa armigera - Chrysoperla carnea* - cropping pattern

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Introduction

Safflower (*Carthomus tinctorius* L.) is one of the most important rainfed and drought tolerant oilseed crops. Safflower is mainly grown for edible oil in the semi-arid tropics in India. Karnataka is the third largest safflower growing state in India. Safflower is attacked by 36 species of pests in India (Bharaj *et al.,* 2003). Out of these the safflower aphid, *Uroleucon compositae* (Theobald) and recently leaf eating caterpillar, *Perigea capensis* (Walker) and capsule borer, *Helicoverpa armigera* (Hubner) are consider to be major pests of the crop in northern parts of Karnataka. The Safflower aphid alone is one of the most distractive pests which reported to cause 35-72 per cent loss in yield during heavy infestation period (Anon., 2007 b).

Materials and Method

Roving survey was carried out in northern parts of the Karnataka to identify major pest of safflower. Eight districts of northern Karnataka viz., Dharwad, Bagalkot, Bijapur, Gulberga, Raichur, Bellary, Koppal, and Gadag were selected and surveyed during December to January 2007-08. The survey comprised 4 to 5 villages in each districts with five fields in each village. The pest incidence and natural enemy populations were recorded as standard procedures (Anon., 2007a).

Results and Discussion

Survey results indicated that the pest intensity was more in sole safflower crop followed by safflower intercropped with Bengal gram. Among the districts surveyed, the safflower aphid population was more at Dharwad, Bellary and Bijapur districts. Among the cropping pattern sole crop and safflower intercropped with Niger harbored more aphid (54 to 58 no. /5 cm twig) than compared to any other cropping pattern (Table-1). Safflower leaf eating caterpillar was noticed in almost all the places, but, their incidence was more at Dharwad, Bijapur and Gadag districts in the early stage of the crop growth. The leaf eating caterpillar population ranged from 1.0 to 4.8 larvae /plant (Table-1). The per cent leaf miner incidence ranged from 10 to >25 % (low to high). The capsule borer population was recorded in almost all the surveyed areas and their population was very high (1.4 to 1.8 larvae /plant) at Gulberga district followed by Bellary district. Among the different cropping patterns, capsule borer population was very high when safflower intercropped with Bengal gram followed by sole safflower crop. The population of aphid was highest in sole crop. While, the aphid population was low in inter cropping situations may be because of repellence of non-preferred host. The capsule borer population was more at Gulberga due to cultivation of pigeon pea during kharif season and the pigeon pea crop suppose to mature during October- November months, later the *Helicoverpa* migrates to the safflower and their by the population was more compared to any other districts surveyed. Among the cropping patterns the capsule borer population was more in safflower inter cropped with Bengal gram (1.5 to 2.1 larvae/ plant).

The natural enemy population (*Chrysoperla carnea* and Coccinellids) were higher in intercropped situation compared to sole safflower crop. However among the intercrops safflower intercropped with coriander (4.2 to 4.6) and sorghum (2.8 to 3.8) harbored more natural enemies.

It can be concluded from the study that, sole safflower and safflower inter cropped with bengal gram harbored more insect pests and the natural enemy population (*Chrysoperla* and Coccinellids). Inter cropping with either coriander or sorghum conserves more natural enemies apart from higher cost benefits. (Table-1)

References

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Table. 1: Survey for Safflower pests and their natural enemies in different Agro-climatic regions of Northern parts of Karnataka state

Districts	Cropping pattern	Aphid/ 5 cm apical twig	Capsule borer / pl.	Safflower caterpillar/ pl.	% Leaf miner incidence	Natural Enemies/pl *Chrysoperla* + Coccinellids
DHARWAD	SF SF+S SF+BG SF+W	56 54 50 52	1.0 0.8 1.2 0.8	4.8 4.6 4.2 4.2	L L M L	2.8 3.6 2.6 3.0
BAGALKOT	SF SF+S	54 50	0.8 0.6	2.0 1.0	M L	3.0 3.8
BIJAPUR	SF SF+S	56 50	0.8 0.6	3.2 3.0	M L	2.6 2.8
GULBURGA	SF SF+N SF+BG	52 52 50	1.6 1.4 1.8	2.0 1.8 1.6	M L L	2.0 2.4 2.4
RAICHUR	SF	50	0.6	2.0	M	2.0
BELLARY	SF SF+S SF+BG SF+C	58 52 50 48	0.8 0.6 1.4 0.8	1.8 1.8 2.6 1.6	M L M L	2.8 3.4 2.2 4.6
KOPPAL	SF SF+W SF+C	54 50 48	1.0 0.6 0.6	2.0 2.0 1.8	M M M	2.8 2.6 4.2
GADAG	SF SF+W	56 54	0.8 0.4	4.2 2.8	H H	3.2 3.0

Note: SF = Sole Safflower W=Wheat L = Low (10 % infestation)
BG=Bengal gram N=Niger M = Medium (11-25 % infestation)
S=Sorghum C=Coriander H = High (>25 % infestation)