

Influence of weather parameters on safflower aphid, *Uroleucon compositae* (Theobald) and its management

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ABSTRACT

Aphid (*Uroleucon compositae* T.) is one of the serious pests of safflower, *Carthamus tinctorius* L. in India. Loss in yield caused by this pest in India ranged from 20 to 80 per cent. Field experiments were conducted during the *rabi* seasons of 2004-05, 2005-06, 2006-07 and 2007-08 to correlate weather parameters with the incidence of safflower aphid and also to evaluate the efficacy of newer insecticides from different groups for its effective management. The variety Bhima was sown in randomized block design with 9 treatments (including absolute control), 3 replications and plot size of 5.0 x 4.5 m² each. Two foliar sprays at 40-45 and 55-60 DAS were given. Among eight chemical treatments, Thiamethoxam 0.005 % and Acetamiprid 0.004% proved best by recording lowest aphid population and producing the highest seed yield of 1224 kg/ha and 1035 kg/ha, respectively. The B:C ratio was highest in Thiamethoxam (2.28) followed by Acetamiprid (1.86), Dimethoate (1.82), and Imidachloprid (1.69). The pest is active during December to January on pre-branching stage of safflower crop, but its appearance on crop totally depends upon prevailing climatic conditions. Low temperatures and high humidity with cloudy weather are conducive for the multiplication of this pest. However, the maximum and minimum temperatures ranged between 30 to 35 °C and 14 to 17 °C, respectively were found most favourable for the rapid development of aphid on safflower. The rise in temperatures and fall in humidity coupled with crop maturity at the end of January had the deleterious effect on it. Thus, for the effective and efficient control of safflower aphid and producing higher seed yield, two sprayings either of 0.005 % Thiamethoxam (Actra) 25 WG or 0.004 % Acetamiprid (Pride) 20 SP or one spray each alternatively first at ETL *i.e.* 40-45 DAS (46th MW, min. temp. below 20°C) and second spray at 55-60 DAS (48th MW, min. temp. around 15°C) is recommended particularly in the safflower growing scarcity zone of Maharashtra (India).

Key words : *Uroleucon compositae*, Weather parameters, Management

INTRODUCTION

Safflower (*Carthamus tinctorius* L.) is one of the important oilseed crops in the world. In India, it occupies an area of 3.77 lakh ha with a production of 2.40 lakh tones and productivity of 637 kg/ha (Anonymous, 2008a). India ranks first in area and second in production of safflower in the world. Maharashtra state of the country is largest producer of safflower having 2.63 lakh ha area and 1.58 tones production with the productivity of 604 kg/ha, which is considerably low.

Safflower crop is often affected by various insect-pests among which, the important and most devastating pest is aphid, *Uroleucon compositae* Theob (Akashe *et al.*, 1999). Seed and oil content losses due to this pest to the extent of 20 to 80 per cent have been reported from different parts of country (Singh *et al.*, 2000). The aphids not only reduce yields of seed and oil content but also attack petals lowering the quality of the value added product of this part of the plant (Sastry, 1997). Control of safflower aphid has been achieved by using different insecticides (Neharkar *et al.*, 2003). This unilateral approach has provided an effective but short term remedy. The major limitations of this method are high cost of cash inputs and insecticidal hazards for plant protection. On

the other hand, control of aphid is difficult due to its fast development rate and high reproductive potential irrespective of meteorological parameters. Efforts were, therefore, made during present investigation to evaluate the efficacy of some of the newly developed insecticides from different groups in comparison with earlier recommended insecticide dimethoate for the effective control of safflower aphid. Efforts were also taken to correlate aphid population with weather parameters so as to manipulate correct timing of pesticidal application.

MATERIALS AND METHODS

The effectiveness of some new insecticides *viz.*, Imidachloprid (Confidor 200 SL) 17.8 % @ 0.0045%, Acetamiprid (Pride) 20 SP @ 0.004%, Thiamethoxam (Actra) 25 WG @ 0.005%, Fipronil (Regent) 5 SC @ 0.01%, Abamectin (Vertimec) 1.8 EC @ 0.0009%, Difenthiuron (Polo) 50 WP @ 0.06% and Buprofezin (Applaud) 25 EC @ 0.04% in comparison with Dimethoate (Rogar) 30EC @ 0.03% were tested for their efficacy against safflower aphid during *rabi* 2004-05, 2005-06, 2006-07 and 2007-08 at AICRPO (Saff.), Solapur (M.S., India). The field experiments were conducted using cv. BHIMA in RBD with 9 treatments, 3 replications and

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