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A Review

A new method of weed control and further evidence of a criticism of Levi and Crafts (1952), Molero and Blackhurst (1956), Carroll (1957) and Singhal and Sen's (1981)

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ABSTRACT
Foliar applications of 100, 200, 1200 mg/ml 2,4-D caused 20, 40, 60% mortality of *Solanum xanthocarpum* Schrad. & Wendl. plants after 6 days of treatment, while the plants treated with 25 and 50 mg/ml 2,4-D showed flowering after 32 and 48 days of treatment respectively. However, the flowering was completely suppressed in all the sets treated with 50 mg/ml and above. These observations were made in the sets treated at the pre-flowering stage. The sets treated with 50, 75, 100, 200 mg/ml 2,4-D showed flower development only up to first 4 days after treatment. It should be noted that even in these sets an initiation of new flowering was never found, however, the flower buds which appeared before treatment developed to maturity. The treatment of 1, 2, 5, 10, 15, 20, 25 mg/ml 2,4-D showed flowering up to 5 weeks after treatment. These observations were made in the sets treated at the post-flowering stage. The sets which were treated at the pre-flowering stage with 25 and 50 mg/ml 2,4-D showed two and one fruit on each plant respectively. The sets which were treated at the post-flowering stage showed 6, 4, 3, 2, 1, 1, 0.9, 0.8, 0.7 fruits per plant with the sets treated with 1, 2, 5, 10, 15, 20, 25, 50, 75 mg/ml 2,4-D respectively against 7 fruits per plant in control. On the 12th day cent percent mortality was found with the treatment of 1400 and 1600 mg/ml 2,4-D, however 40% plants were surviving with the treatment of 1200 mg/ml. Therefore, the lethal dose for *S. xanthocarpum* was proved to be 1400 mg/ml 2,4-D. From the present work as well as the previous work (Salgare, 1986, 2002) it is concluded that because of the suppression of the flowering of the weeds there will be no fruit formation and seed-setting at all. This will result in the complete suppression of the future generation. Moreover, the weed control would be achieved with a very low concentrations of the herbicides, which will be very economical. It will also avoid the danger of pollution and damage to the crop as well.

Key words : Weed Control, Weeds, Environmental Sciences, Herbicides.

INTRODUCTION

Farmers throughout the world have several common problems and eradication of weeds is one of them. In the case of some crops, the yield may be reduced by more than 50% due to unchecked weed growth (Mani, Arora and Gautam, 1968). Weed control is the most pernicious and troublesome problem. Weeds, though unwanted, are often prolific and persistent.

The weed control by chemical means has been replacing or supplementing traditional cultural methods in most of the agriculturally advanced countries. Due attention is being paid to the problem in these countries since the economic return from the crop is dependent upon it to a considerable extent. A large number of chemicals, inorganic, organic and auxin herbicides have been used for this purpose. Khosla (1967) stated that no lethal doses could be determined for *Achyranthes aspera* and *Cassia tora* since maleic hydrazide recrystalised at room temperature beyond 5400 ppm. In fact it is apparent that the dosage required to kill the weeds through its conductive tissue is often sufficient to kill the crop as well. Thus, Crafts (1946) reported that spray of 4% solution of sodium arsenite destroyed all barley plants and weeds growing in the same plot. Mitra (1952) and Shivapuri and Sinha (1953) noted some adverse effect of higher concentrations of 2,4-D on crop plants such as abnormalities and sterility of some of the florets and consequent reduction in the yield of wheat. Salgare (2002) doubted whether the chemical weed control is justified ?

Under such circumstances how far it is justified to follow this old practice ? Salgare stated that instead of the conductive elements we should make reproductive units (pollen, ovule, embryo) as the targets of weed control. In this connection it is worth quoting Rehm (1952) who stated that full male sterility was found with 5 ppm of 2,4-D, however, no definite conclusions on the female fertility of the tomato can be made at this stage. Even the work of Moore (1950), Naylor (1950), Jain (1959), Chopra, Jain and Swaminathan (1960), Seetharam and Kusuma Kumari (1975) and Salgare (2002) is encouraging in this respect. Studies in the 1930's showed that fungicides, such as Bordeaux spray, when used in orchards, often decreased fruit set. Investigators found that copper, mercury, or arsenic as spray residues on flowers or brought in by bees, decreased pollen germination, resulting in low fruit set (Eaton, 1957).

MATERIALS AND METHODS

Solanum xanthocarpum Schrad. & Wendl. is a very common weed found growing in the crop fields throughout the country. Foliar applications of 25-25-100, 200-200-1600 mg/ml 2,4-Dichlorophenoxy acetic acid (2,4-D) were made at 60 day old plants (pre-flowering stage) and 1,2, 5-5-25, 25-25-100, 200-200-1000 mg/ml 2,4-D at 110 day old plants (post-flowering stage) of *S. xanthocarpum* by air-compressor. The observations were recorded every