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Allelopathic Effects of Sunflower on Some Operative Components of Cotton

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ABSTRACT: In order to investigate the allopathic effects of sunflower on cotton germination, this research was done in the form of a quite accidental plan with 3 replications. The density of the extracts involved 3 levels for sunflower (50, 100 and 150%) and also the control treatment (0%). The sunflower extract showed a lot of preventing effects on germination and growth of cotton plant. The statistical comparisons showed that as the density of the extract increases, the number of leaves, the number of subshrubs, the size of the shrubs, the number of flowers and the yarns weight has a significant decrease in comparison with control. The most amount of decrease among all the measured parameters was that of 150 mg/l density.

***Keywords*:** Allelopathy, Cotton, Extract, Sunflower

INTRODUCTION

Considering the extensive use of chemical pesticides specially herbicides in the last recent decade, using the allelopathic plants and also their remains in the soil for controlling the plants and providing good growth conditions, has been noticed a lot (Inderjit and Keating, 1999).

Sunflower is a plant that has allelopathic effects. This plant decreases the germination and growth of other plants by releasing toxic secretions materials (Leather, 1987). In a research, Zia-Hosseini et al (2002) by investigating the allelopathic effects of sunflower extract on germination and growth of cotton plant, come to the conclusion that sunflower extract has significant effect on the percent of greenness, the height of the bush, dry weight and also cotton operation. In many other researches the allelopathic effects of the sunflower on other plants have been proved (Cernusko and Boreky, 1992;Semidy, 1992; Macias et al., 1993; Macias et al., 1994; Narwal and Tauro, 1996).

In other researches that have been done about other plants, allelopathic effect of *Salvia officinalis* extract on barley and purslane (Bajalan et al., 2013), the extract of some weeds on wheat (Kiarostami, 2004) and *Zhumeria majdae* on wheat and tomato (Soltani poor et al., 2006) are proved. This research was done in order to compare and investigate the allelopathic effects of different densities of sunflower extract on some characteristics of cotton.

MATERIALS AND METHODS

To do this experiment, first the seeds were planted in the vases then the vases were watered with water once. The place of the vases in the greenhouse was accidental and for each treatment 3 replications (3 vases) were considered. The treatments were 0, 50, 100 and 150% densities of sunflower extract. To provide the extract, the dried aerial part of plant was used. The drying process and getting to a fixed weight was done, too. After providing

the extracts, the plant was watered by the extract water of the sunflower in deferent densities, based on the plant water need. Under the vases a container was placed in order to gather the drainage water.
For each treatment the accidental samples of aerial parts of the plant were chosen and assess of determinatives every 10 days after 2 weeks since planting were measured. The reviewed characteristics in this experiment were height of the bush, the number of leaves, the number of subshrubs, the number of flowers and the weight of the yarns. In order to measure the height, meter and in order to measure the weight, digital scale were used. The analysis of the data and drawing the diagrams were done by MSTAT-C and EXCEL 2007.

RESULTS AND DISCUSSION

Blush height

The results showed that the height of the cotton plant significantly decreases under the effect of different densities of sunflower extract in comparison with control. After control, the most height of the plants belonged to 50 mg/l treatment (figure 1).

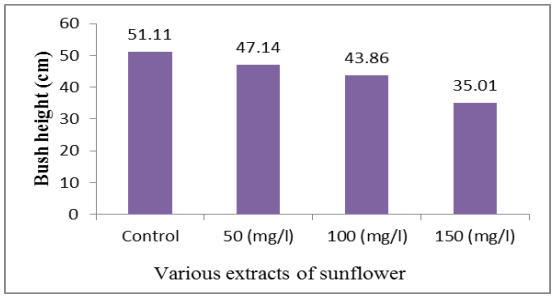

Figure 1. The effect of various extracts of sunflower on the blush height

The number of leaves and accessory branches in the bush

The results of comparing the average of data showed that there is a significant difference between the number of leaves and the number of accessory branches in the bush in all densities in comparison with control. The most number of leaves after control belonged to 150 mg/l treatment and the last number belonged to 150 mg/l treatment (Figure 2).

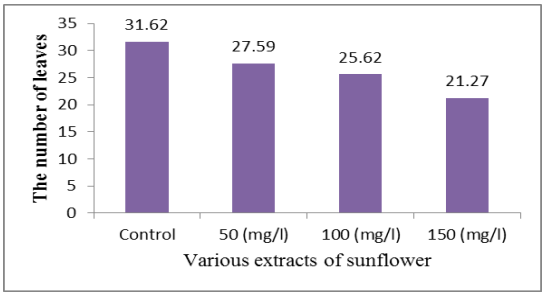

Figure 2. The effect of various extracts of sunflower on the number of leaves

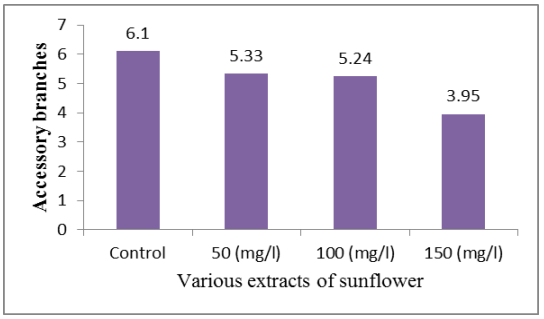

Figure 3. The effect of various extracts of sunflower on the number of accessory branches

The number of flowers and the weight of yarn

The least number of flowers in the bush belonged to 150 mg/l and the most numbers belonged to control treatment. Also all the used densities had a significant difference with control (Figure 4). As well as this, the heaviest weight of yarns belonged to control and then it belonged to 50 mg/l density (Figure 5).

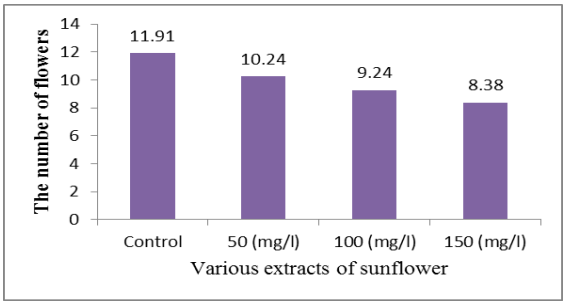

Figure 4. The effect of various extracts of sunflower on the number of flowers

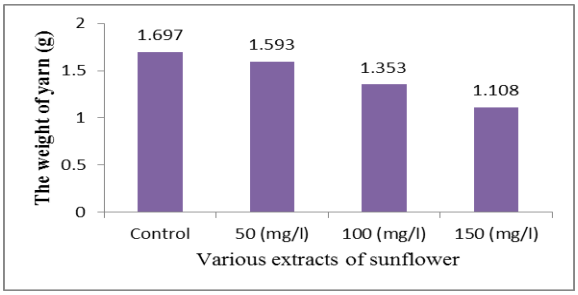

Figure 5. The effect of various extracts of sunflower on the weight of yarn

The results of this research showed that the different used densities of sunflower have serious allelopathic effects on the growth components of cotton. These effects will be increased as the density of the extract increases. The results of this study were agree with the results of the research of(Zia-Hosseini et al .,2002), regarding the allelopathic effects of sunflower on growth and germination of cotton. By the use of the conclusions of this research we come to the conclusion that the combining planting sunflower and cotton is not suitable. Also in order to follow the planting sequence, cotton must not be planted after sunflower. More information regarding this, needs more research.

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