



AENSI Journals

Journal of Applied Science and Agriculture

ISSN 1816-9112

Journal home page: www.aensiweb.com/jasa/index.html



## Allelopathic Effects of Cotton (*Gossypium hirsutum*) on Some Operative Components of itself

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### ARTICLE INFO

#### Article history:

Received 14 November 2013

Received in revised form 19

January 2014

Accepted 21 January 2014

Available online 5 March 2014

#### Keywords:

*Gossypium hirsutum*,

Allelopathy, roots extract

### ABSTRACT

**Background:** This study reports the effects of roots extract from Cotton (*Gossypium hirsutum*) on germination and growth of the cotton. **Objective:** The density of the extracts involved 3 levels for sunflower (50, 100 and 150%) and also the control treatment (0%). **Results:** The results showed the strong allelopathic effect of the extract of cotton on germination and growth of itself in such a way that the statistical **Conclusion:** comparison indicates the reduction of germination percentage of seeds in treating the aqueous extracts in comparison with control in the level of 5 percent.

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**To Cite This Article:** Shahram Rezaee, Iman Bajalan, Masoumeh Zand., Allelopathic Effects of Cotton (*Gossypium hirsutum*) on Some Operative Components of itself. *J. Appl. Sci. & Agric.*, 9(1): 77-80, 2014

## INTRODUCTION

The cotton product is called "white gold" because of its economic and commercial value in the world and the need for cotton textiles is increasing (Akramghaderi *et al.*, 2003). Producing cotton and its related industries is one of the most important jobs and income resources for different countries. Cotton is grown mostly because of its yarns, but due to being an old plant, it is also important (Panjeh koob *et al.*, 2007).

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). 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 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 cotton extract. To provide the extract, the dried roots 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 cotton in different densities, based on the plant water need. Under the vases a container was placed in order to gather the drainage water.

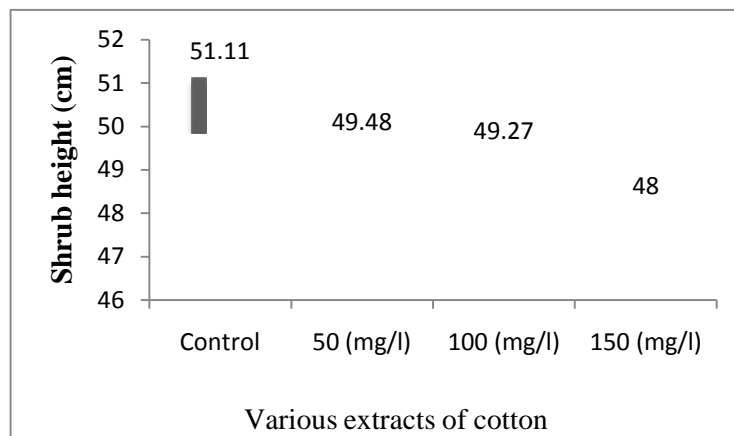
For each treatment the accidental samples of root parts of the plant were chosen and assess of determinatives every 10 days after 2 weeks since planting were measured. The reviewed characteristics in this experiment were height of the bush, the number of leaves, the number of sub shrubs, the number of 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).

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## RESULTS AND DISCUSSION

### *Shrub height:*

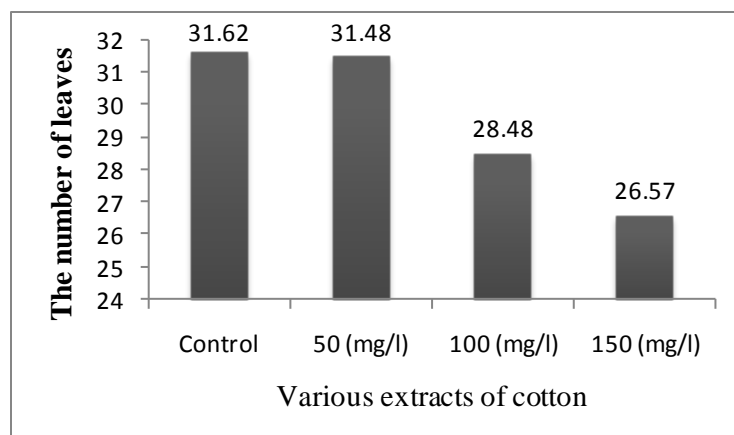
The results showed that the height of the cotton plant significantly decreases under the effect of different densities of sunflower extract in comparison with control. After control, the most height of the plants belonged to 50 mg/l treatment (figure 1).



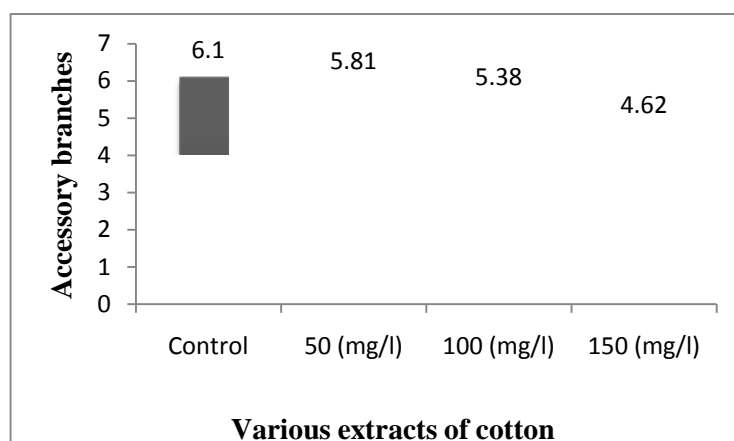
**Fig. 1:** The effect of various extracts of cotton on the shrub height of cotton.

### *The number of leaves and accessory branches in the shrub:*

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).



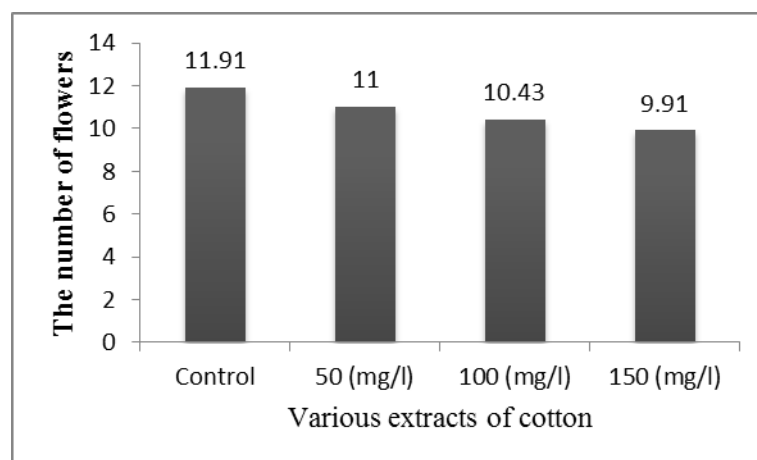
**Fig. 2:** The effect of various extracts of cotton on the number of leaves of cotton.



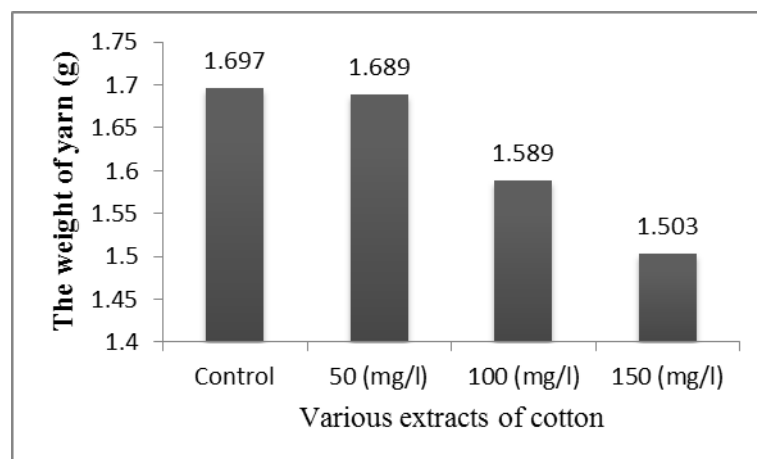
**Fig. 3:** The effect of various extracts of cotton on the number of accessory branches of cotton.

*The number of flowers and 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).



**Fig. 4:** The effect of various extracts of cotton on the number of flowers of cotton.



**Fig. 5:** The effect of various extracts of cotton on the weight of yarn of cotton.

*Conclusion:*

The results of this research showed that the different used densities of cotton have serious allelopathic effects on the growth components of cotton. These effects will be increased as the density of the extract increases. By the use of the conclusions of this research we come to the conclusion that in order to follow the planting sequence, cotton must not be planted after cotton. More information regarding this, needs more research.

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