EFFICIENCY OF SOME HERBICIDES USED ON WHEAT CROP AND THEIR SIDE EFFECTS

By
SAMEH HAMADA EL-SAYED HAMADA
B.Sc. Agric. (Plant Protection - Pesticides), Faculty of Agric.Cairo,
Al-Azhar University, 2003

THESIS
Submitted in Partial Fulfillment of the Requirements for the Degree

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In
AGRICULTURAL SCIENCES
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APPROVAL SHEET

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Approved by:

Prof. Dr. MOHAMED ABDELHADY KANDIL .....
Professor of Pesticides, Department of Economic Entomology and Pesticides, Faculty of Agriculture, Cairo University, Egypt.

Prof. Dr. HASSAN M. S. KHALIFA .....
Professor of Pesticides, Department of Plant Protection, Faculty of Agriculture, Al-Azhar University, Cairo, Egypt

Prof. Dr. MAHMOUD F. ABDEL-LATEEF .....
Professor of Pesticides, Department of Plant Protection, Faculty of Agriculture, Al-Azhar University, Cairo, Egypt

Prof. Dr. ABDALLA E. ABDELMONEM .....
Professor of Pesticides, Department of Plant Protection, Faculty of Agriculture, Al-Azhar University, Cairo, Egypt .

Date: 8 -3 - 2014 A.D.

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Supervision Committee:

Prof. Dr. MAHMOUD F. ABDEL-LATEEF .....
Professor of Pesticides, Department of Plant Protection, Faculty of Agriculture, Al-Azhar University, Cairo, Egypt

Prof. Dr. ABDALLA E. ABDELMONEM .....
Professor of Pesticides, Department of Plant Protection, Faculty of Agriculture, Al-Azhar University, Cairo, Egypt

Prof. Dr. ABDEL-LATEEF A. R. HELALIA .....
Professor of Pesticides, Department of Plant Protection, Faculty of Agriculture, Al-Azhar University, Cairo, Egypt

Dr. RAMADAN M. A. EL-KHOLY .....
Assistant Professor of Pesticides, Department of Plant Protection, Faculty of Agriculture, Al-Azhar University, Cairo, Egypt.

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1. INTRODUCTION

Wheat is one of the most important cereal crops in Egypt, either as a staple food grain for human or as a major source of straw fodder for animal feeding. Wheat production is not sufficient to our needs in Egypt. Therefore, improving cultural practices for wheat production is essential to enhance wheat production. The area cultivated with wheat in Egypt increased to 1.350 million hectares in 2012 season compared to 1.280 million hectares in 2011 season (**Anonymous, 2012).**

Weeds are major agricultural pests that can adverse crops if not properly controlled or managed**.** These weeds compete with crop plants for nutrients, water content, space, light and many other growth factors which not only reduce crop yield but also deteriorate quality of farm production and thereby reduce its market value (**Cheema and Akhtar, 2005; and Grichar, 2006).**

Narrow (grassy) and broad-leaved weeds dominated in wheat fields represent very serious problem which may increase rapidly and cause losses in wheat yield ranged from 20 - 50 % depending on many factors particularly weed species (**Rao, 1983; Bhan *at al.*, 1985**; **Al-Marasafy *et al.*, 2001; Ahmad and Shaikh, 2003; El-Khanagry and Sbaban, 2005; Dangwal *et al.*, 2010).**

Govindra and Singh (2005) and Hesammi (2011) reported that the mixed population of *Avena ludoviciana*, *Phalaris minor* and *Chenpodium album* caused 44 to 66% reductions in wheat grain yield in weed infested plots, respectively.

Chemical weed control plays an important role in improving the plant growth and productivity of wheat. Previous reports demonstrated that many pre-emergence and post-emergence herbicides are effective in controlling annual narrow (grassy) and broad-leaved weeds in wheat fields with excellent selectively **(Martin *et al.*, 1990; Warshney and Singh, 1990; Helalia, 1993; Jarwar *et al.*, 1999; Singh and Singh, 2002; Salama, 2004; El-Khanagry and Shaban, 2005). Duke and Lydon (1987)** reported that chemical control methods are usually easy, highly effective, most economical approaches and proved to be more effective than mechanical methods.

The present study was conducted to evaluate the efficiency of some herbicides for controlling weeds in wheat and their effects on wheat grain yield and its components during the two successive seasons 2009-2010 and 2010-2011.

The chronic toxicity of the tested herbicides against albino rats was also studied. This includes: general observations, body weights of rats for seven months, organs weights and

histopathological examinations of treated rats in relation to untreated ones.

2. Review of Literature

2.١. Chemical weed control in wheat.

2.1.1 Efficiency of tribenuron-methyl formulations.

The sulfonylurea herbicides are widely used to control broad-leaved weeds in wheat fields**.** It inhibited the enzyme acetolactate synthesase (ALS). Many researchers have reported that herbicide treatments gave satisfactory control of weeds in wheat **(Ray, 1984)**.

Fayed (1992) and Fayed *et al. (*1993) found that chemical weed control treatments reduced weeds dry weight and decreased weeds population m^{-2} comparing to untreated. The minimum dry weight of *Rumex dentatus* was noticed with applying Brominal. While, the minimum dry weight of *Beta vulgaris, Chenopodium murale, Medicago hispisda*, *Lolium temulentum* and *Rumex dentatus* was observed with the application of Granstar. The decreased dry weight of weeds may be due to the effectiveness of Brominal and Granstar as post-planting herbicides on different weed species as well as the long acting effect of the herbicides.

Khan and Haq (1995) determined the effects of several new herbicides as post-emergence sprays on weed control and yield in wheat including tribenuron (Express 75 % DF) and 2,4-D. They found that tribenuron 75% DF was also very effective