

Efficacy of Certain Herbicides and Their Mixtures on Cotton Weeds and Their Impact on Yield and Yield Components

Mahmoud M.S. M. and Sabra F. S.

Department of Pesticide chemistry, Faculty of Agriculture, Alexandria University

Received on : 4/10/2009

Accepted 9/11/2009

ABSTRACT

A field experiment was carried out to evaluate the efficiency of some herbicides and herbicidal mixtures on cotton (*Gossypium barbadense* v.Giza 86) weeds and yield for two successive seasons (2007-2008) at El-Beheira governorate. The herbicide treatments were convoy (prometryn+fluometuron), amex (butralin), gesagard (prometryn), harness (acetochlor), convoy (prometryn+fluometuron)+amex (butralin), gesagard (prometryn) + amex (butralin), harness (acetochlor)+amex (butralin), weed free, hand weeding and unweeded check. These herbicide treatments were not recommended on cotton crop.

The results revealed that the dominant weed was Common purslane (*Portulaca oleracea*) in the first season and Livid amaranth (*Amaranthus ascendens* lois) in the second season. The best treatment which gave maximum weed reduction as well as maximum yield increment was weed free, while best herbicide treatments which gave maximum weed reduction and maximum yield increment were acetochlor and its mixture with butralin. The results showed that acetochlor caused reduction in total weeds valued by 94.1% and 90.2% after 45 and 90 days respectively, in the first season and 93.6% and 91.7 % in the second season, also acetochlor mixed with butralin caused 92.4% and 84.8% total weeds reduction after 45 and 90 days respectively in the first season, and 91.7% and 87.2% in the second season. On the other hand, acetochlor increased feddan yield to be 1.78 ton/feddan (11.28 qintar/feddan) and 1.82 ton/feddan (11.56 qintar/feddan) in the first and second seasons, respectively, compared to unweeded check which gave 0.49 ton/feddan (3.14 qintar/feddan) in both seasons.

Key Words: Cotton, herbicides, herbicidal mixtures.

INTRODUCTION

Cotton is a slow-growing plant, and only a limited selection of herbicides can be used for cotton weed control. These two factors sometimes make weed control difficult. Because herbicides are expensive to develop, most are developed for large acreage crops, such as corn and soybeans. Compared to these crops, cotton acreage is small, which reduces incentive to develop new herbicides for cotton. This limits the available herbicides. Those that are available often have narrow selectivity (safety) margins relative to crop tolerance (Kendig *et al.*, 1994). Herbicides are the most effective means for controlling weeds in cotton. Preplant and/or pre-emergence applications are important for ensuring that the cotton has the initial competitive advantage over the weeds. Once this is achieved, then post-emergence directed applications can be utilized to extend the weed control through the season. (Ferrell *et al.*, 2009). The greatest competition usually occurs early in the growing season. Late-season weeds, while not as competitive as early-season weeds, may interfere with insecticide applications and may cause harvesting difficulties. Weed competition at square formation and flower formation stages proved to be more harmful as compared to the weed competition effects at later stages (Farrell *et al.*, 2001). The simulated adverse effects of the herbicides on cotton yields varied from location to location due to their

interactions with soil, plant and atmospheric variables.(Reddy *et al.*, 1990).

Chemical weed control decreased the weed infestation and gave highest seed cotton yield and net return/ha (Patel *et al.* 1985). Balyan *et al.* (1983) and Singh *et al.* (1987) and Khan *et al.* (1994) obtained highest seed cotton yield with application of pendimethalin. Panwar *et al.* 1988, cited that weed control is one of the major constraints for low cotton yield. The infestation of weed flora in cotton crop reduced the yield by 1.28 and 1.60 tonnes/ha compared to yield of 2.41 and 2.33 tonnes/ha from weed free cotton field of India.

The aim of this work is to evaluate some herbicide treatments which were not recommended for cotton weeds in Egypt and to improve the effect of other herbicides by using mixtures between them.

MATERIALS AND METHODS

A field experiment was carried out in Elhagger-Beheira governorate to control broad leaved weeds, grassy weeds and total weeds in cotton (*Gossypium barbadense* v.Giza 86) during two successive seasons (2007-2008). The experimental design was a randomized complete block design with four replicates (the area of each replicate was 21m²). The herbicidal treatments, names and rates of application are presented in Table (1). The herbicidal treatments in both seasons were applied as a preemergence