

INTEGRATED WEED MANAGEMENT IN MAIZE

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Approval Sheet

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ABSTRACT

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Two field experiments were conducted at the Research and Experimental Station Farm, Faculty of Agriculture, Ain Shams University at Shalakan, Kalubia Governorate, Egypt, during ٢٠٠٩ and ٢٠١٠ growing seasons. These experiments aimed to study the response of maize (yield, yield components, grain chemical composition) and associated weeds to eleven weed management treatments: pendimethalin, acetochlor, metribuzin, pendimethalin+metribuzin, acetochlor+metribuzin, pendimethalin+hoeing once, acetochlor+hoeing once, metribuzin+hoeing once, hoeing once, hoeing twice and unweeded, as well as two N rates (٩٠ and ١٢٠ kg N/fad. Results showed that acetochlor+hoeing once was the most effective treatment against grassy, broadleaf and total weeds in both growing seasons. Such potent treatment was statistically at par for diminishing total weeds with those of hoeing twice in ٢٠٠٩ and metribuzin+hoeing once in ٢٠١٠. Maize plots treated with ١٢٠ kg N/fad gave the highest value of dry weight of all weed groups. Grain yield, oil yield, protein % and protein yield possessed the highest values due to the application of acetochlor+hoeing once or hoeing twice. Also, plant height, ear length, weight of ١٠٠ grains, ear yield and grain yield, oil % oil yield, protein % and protein yield recorded the highest increases due to fertilizing maize plant by mineral N at ١٢٠ kg/fad over those of ٩٠ kg/fad. Moreover, the highest grain yield and its components and grain chemical composition were obtained from weeded treatments under the higher N rate. Available results divulge that survival %, seedling height and shoot dry weight of wheat; faba bean and squash were not substantially affected by the probable residues of the applied herbicides in maize field.

Keywords: Maize, weed management, N rates, residues.

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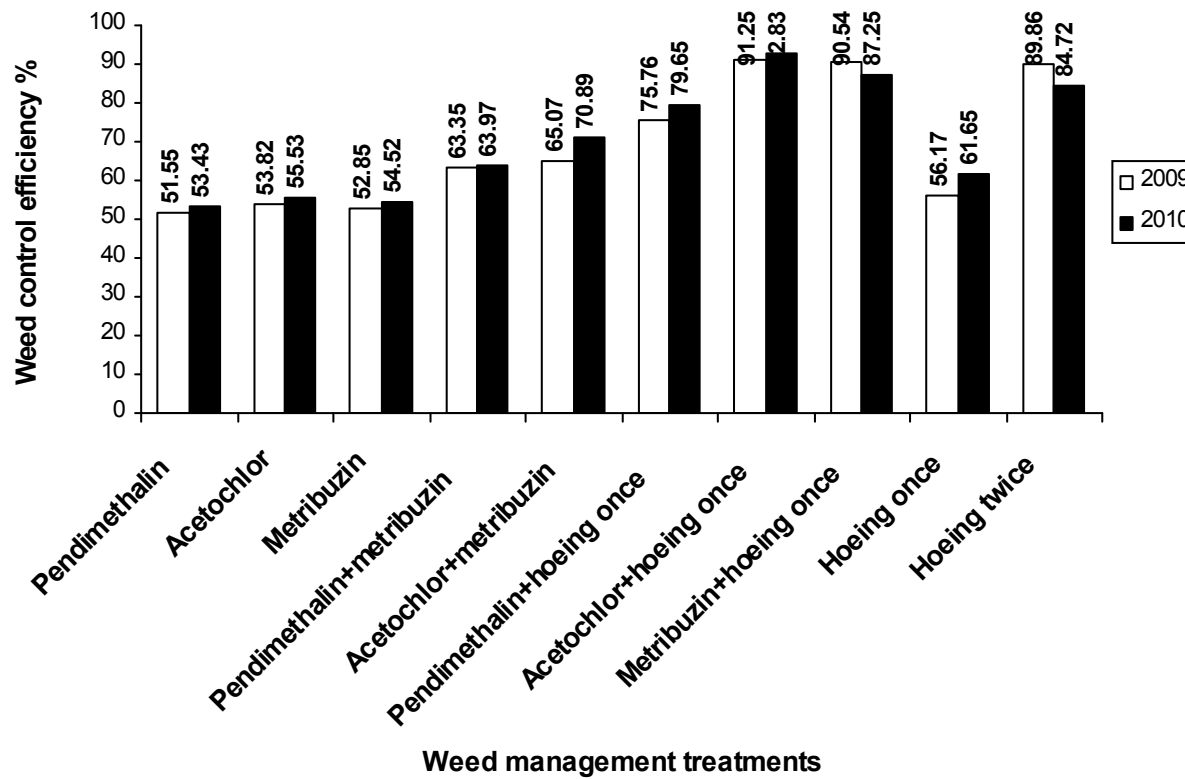


Fig (1): Weed control efficiency % of weed management treatments at 9 weeks from maize sowing in 2009 and 2010 seasons

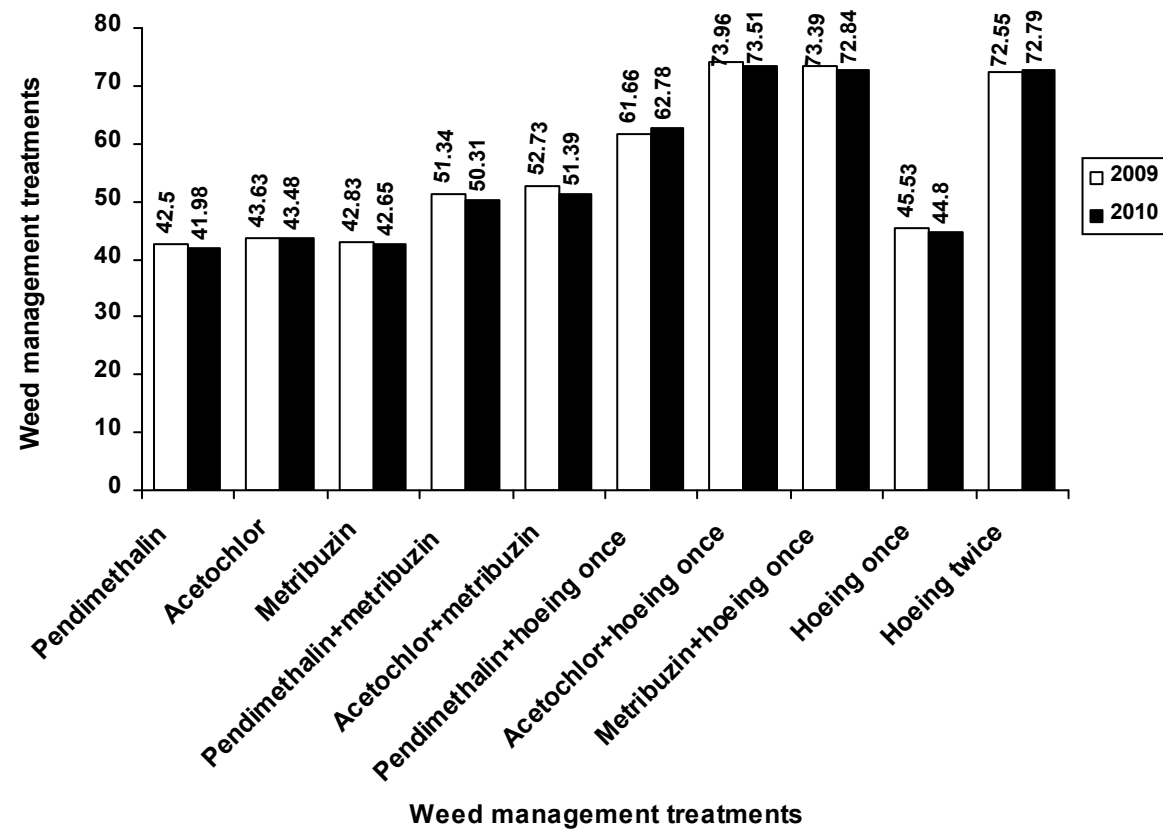


Fig (2): Weed control efficiency % of weed management treatments at 12 weeks from maize sowing in 2009 and 2010 seasons

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INTRODUCTION

Maize is a major cereal crop in many countries and ranks third, behind wheat and rice in area (**FAO**). In Egypt, the local production declined under self sufficiency level, resulting in some serious crop losses. To overcome the deficiency of maize productivity, it must be maximized through good achievement of some agricultural practices, i.e. weed management and nitrogen fertilization.

Manual weeding and several herbicides could be used in maize for weed control. Maize is largely planted at row distances around 80 cm. In row crops, hoeing and herbicide application are nowadays often used in combinations that vary with crop, soil, climate and cropping system (**Håkansson, 2003**).

It is widely well known that weed competition is one of the major crop constraints, and therefore weeds must be controlled (**El-Bially, 1995**). In this regard, if provided with a weed-free period for three weeks after emergence, corn will compete effectively with weeds emerging afterward. Conversely, corn can withstand weed competition for up to six weeks if it is then weeded and kept weed-free (**Zimdahl, 2007**). Because mechanical tool of weed control is time consuming, may damage crop plants as well as the required hand-labor is scarce and expensive, chemical method as an alternative could be used (**El-Bially, 1995**).

Grain yield in maize can be severely reduced by competition with weeds (**Najafi and Tollenaar 2005**). An extended study on maize grain production showed that weed infestation came in the first order of yield limiting factors and represented 27-38% (**Subedi and Ma, 2009**). Although maize is a vigorous and tall growing plant, it is susceptible to weed competitions (**Evans, 2001**). The reduction in maize yield due to weed competition reached 66-90 % (**Dalley et al,**