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CHEMICAL CONTROL OF *ANNUAL RYEGRASS* GROWING WITH BARLEY DURING PRE-EMERGENCE STAGE BY METHABENZTHIAZURON, ISOPROTORON AND CHLOROTOLURON

[31]

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Keywords: Rye grass, Growing with barley, Methabenzthiazuron, Isoprotoron and Chlorotoluron

ABSTRACT

Treatments by three herbicides named; Methabenzthiazuron, Isoprotoron and Chlorotoluron to control Italian ryegrass growing with barley during pre-emergence stage were investigated. Results showed that clear damage have been occurred by the three chemicals without prominent effect on barley plants. Italian ryegrass was controlled significantly ($p<0.01$) by all of the herbicides used but the three herbicides differed significantly ($p<0.05$) in their effects. Chlorotoluron gave effective control of *Lolium multiflorum* at dose of 2kg a.i/ha and slight damage on barley was observed. Isoproturon and methabenzthiazuron were less effective as more than 40% of *Lolium multiflorum* survived at different doses while barley was not affected significantly.

INTRODUCTION

Barley is one of the oldest cultivated cereal grains in the world **(Baik & Ullrich, 2008).** Barley, a founder crop of old World Neolithic food production and one of the earliest domesticated crops **(Zohary & Hopf, 2000 and Zohary et al 2012).** Weeds can be controlled by manual hoeing, mechanically and by chemical methods. Manual weeding is labor intensive and possible only on small scale. While mechanical weed control is possible in row cropping and leaves intra row weeds. Herbicides offer the most practical, effective and economical means of reducing early weed competition and crop production losses **(Royal Society of Chemistry, 1991; Worthing, 1991. Troxler et al 2002; Brecke and Stephenson, 2006).** Methabenzthiazur 1-(1,3-Benzothiazol-2-yl)-1,3-dimethylharnstoffon is used for the control of a spectrum of grasses in cereals, legumes, maize, garlic and onions. **Madhun & Freed, 1978.** Chlorotoluron 3-(3-chloro-*p*-tolyl)-1,1-dimethylurea is a pre- or early post-emergence herbicide widely used to control annual grasses and broad-leaved weeds in winter cereals **Chandurkar, et al 1990.** Isoprotoron 3-(4-isopropylphenyl)-1,1-dimethylurea; 3-p-cumenyl-1,1-dimethylurea is a selective systemic herbicide used as Pre- and post-emergence control of annual grasses **(Splild, and Køppen, 1998).**

MATERIALS AND METHODS

Methabenzthiazuron, Isoprotoron and Chlorotoluron were applied as pre-emergence treatments to 10 cm^2 pots with 50 seeds of *Lolium multiflorum* sown on the surface and 10 seeds of barley planted 2 cm deep in John James No. 1 compost. The three herbicides were applied at five different doses; methabenzthiazuron at (0, 1, 1.5, 2, 3 kg $a.i.ha^{-1}$; Isoproturon at 0, 0.5, 1, 1.25, 1.5 kg $a.i.ha^{-1}$) and chlorotoluron at (0, 1.5, 2, 2.5, 3 kg $a.i.ha^{-1}$). Triplect sets were mused for each treatment. Treatments were applied three days after planting, Observations were taken 2 weeks later by counting the number of plants and fresh weight /20 plants for both ryegrass and barley.

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RESULTS AND DISCUSSION

While others report good crop safety in wheat. Italian ryegrass was controlled significantly ($p<0.01$) by all of the herbicides used but the three herbicides differed significantly ($p<0.05$) in their effects Reports of clear damage from these chemicals have been made **(Kasasian, 1977; Fleck and Paulitsch, 1978)**.

Chlorotoluron gave effective control of *Lolium multiflorum* at dose of 2kg a.i/ha and slight damage on barley was observed **(Figs. 1- 2)**. Isoproturon and methabenzthiazuron were less effective as more than 40% of *Lolium multiflorum* survived at different doses **(Figs. 3-6)**. Barley was not affected significantly. Moreover, reports of clear damage from these chemicals have been made by **(Kasasian, 1977 and Fleck & Paulitsch, 1978)**.

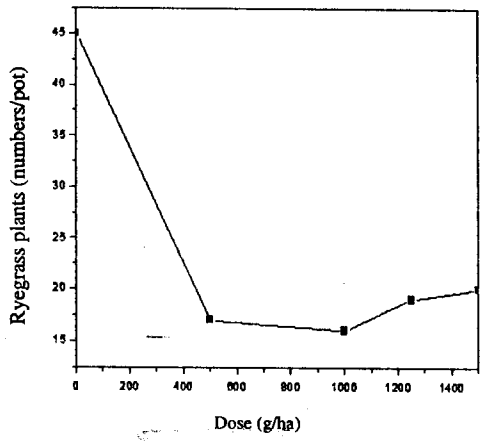

Fig. 3. Effect of Isoproturon on annual ryegrass plants (numbers /pot)

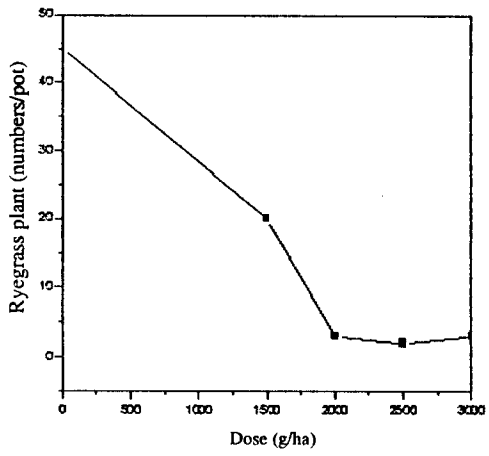

Fig. 1. Effect of Chlorotoluron on annual ryegrass plants (numbers /pot)

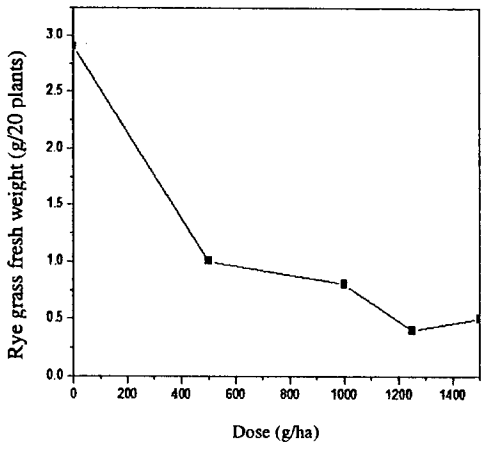

Fig. 4. Effect of Isoproturon on annual ryegrass fresh weight (g/20 plants)

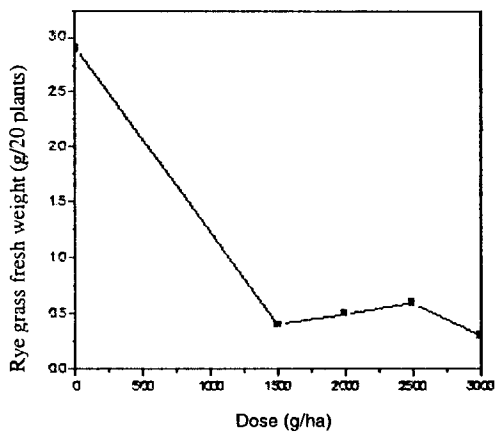

Fig. 2. Effect of Chlorotoluron on annual ryegrass fresh weight (g/20 plants)

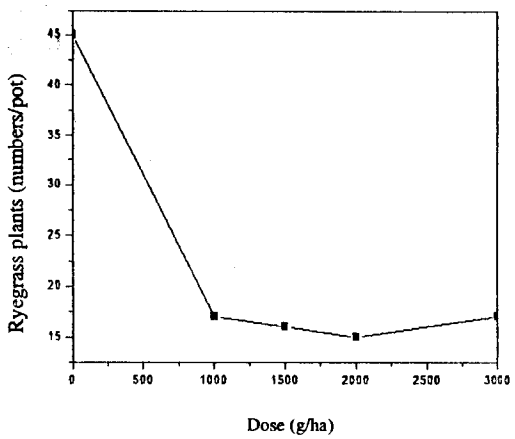

Fig. 5. Effect of Methabenzthiazuron on annual ryegrass plants (numbers /pot)

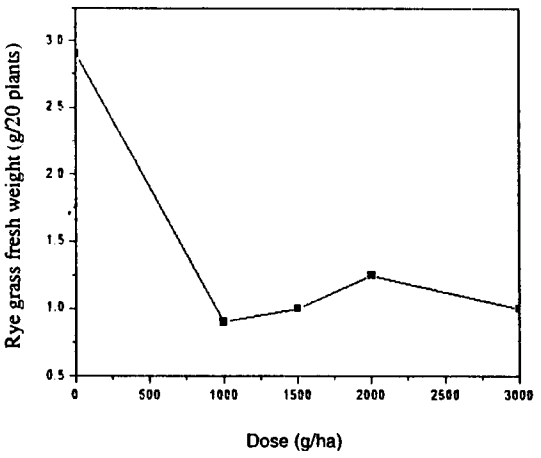

Fig. 6. Effect of Methabenzthiazuron on annual ryegrass fresh weight (g/20 plants)

REFERENCES

Baik, B.K. and Ullrich, S.E. 2008. Barley for food: characteristics improvement and renewed interest. **J. Cereal Sci., 48: 233–242.**

Brecke, B.J. and Stephenson, D.O. 2006. Weed control in cotton (*Gossypium hirsutum* L.) with postemergence applications of trifloxysulfuron-sodium. **Weed Technol., 20(2): 377-383.**

Chandurkar, P.S., Cheng, E.Y. and Menzer, R.E. 1990. Metabolism of N-[3-chloro-4-(beta-D-glucosylmethyl) phenyl] urea, a metabolite of chlorotoluron, in rat and Japanese quail. **J. Agric. Food Chem., 38: 1739-1742.**

Fleck, N.G. and Paulitsch, R.J. 1984. Chemical control of ryegrass (*Lolium multiflorum L.*) in weaht. **Planta Daninha, 1(2): 30-37.**

Kasasian, L. 1977. Chemical control in winter cereals at the Hofuf Agricultral Research Center. Saudi Arabia. In Jaunt Agricultural Research and Development Project No. 111.

Madhun, Y.A. and Freed, V.H. 1987. Degradation of the herbicides bromacil, diuron and chlortoluron in soil. **Chemosphere, 16(5):1003-1011.**

Plumier, W. and Vulsteke, G. 1988. J. Agric. Food Chem., 36: 642–645.

Royal Society of Chemistry 1991. The Agro-Chemicals Handbook, 3rd ed. Cambridge. **pp. 125-210.**

Splild, N.H. and Køppen, B. 1998. Occurrence of pesticides in Danish shallow ground water. **Chemosphere 37:1307–1316.**

Troxler, S.C., Askew, S.D., Wilcut, J.W., Smith, W.D. and Paulsgrove, M.D. 2002. Clomazone, fomesafen, and bromoxynil systems for bromoxynil resistant cotton (*Gossypium hirsutum*). **Weed Technol. 16: 838–844.**

Worthing, C.R. 1991. The Pesticide Manual, 9thed. Farnham, British Crop Protection Council. **pp. 15-17.**

Zohary, D. and Hopf, M. 2000. Domestication of plants in the Old World. 3rded. Oxford: Oxford University Press. **pp. 110-120.**

Zohary, D., Hopf, M. and Weiss, E. 2012. Domestication of Plants in the Old World: The origin and spread of domesticated plants in Southwest Asia, Europe, and the Mediterranean Basin. 4th ed. Oxford: Oxford University Press. **pp. 21-40.**

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مجلة اتحاد الجامعات العربية
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التحكم الكيميائى فى نمو عشبة الجويدار النامية مع نبات الشعير خلال فترة ما قبل البزوغ بواسطة المبيدات العشبية ميثابنزثيازورون والأيزوبروتورون والكلوروتوليورون

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الكلمات الدالة: عشبـــة الجويـــــدار، الشعيـــــر ميثابنزثيازورون والأيزوبروتورون والكلوروتوليورون

الموجـــز

أجريت معاملات لثلاث مبيـدات عشبيـة هـــى ميثابنزثيازورون والأيزوبروتورون والكلوروتوليورون للتحكم فى نمو عشبة الجويدار النامية مع نبات الشعير خلال مرحلة ما قبل البزوغ، وقد أظهرت النتائج تأثير واضح على نمو هذه العشبة بدون أى تأثير يذكر على نبات الشعير، وقد وصل التأثير ذا الدلالة الإحصائية على العشبة درجة ($p<0.01$)، ولكن اختلف هذا التأثير ذا الدلالة الإحصائية لكل مبيد على حده بدرجة ($p<0.05$) حيث أعطى المبيد العشبى الكلوروتوليورون تأثير واضح على العشبة عند تركيز ٢كجم/هكتار مع تأثير بسيط على نبات الشعير، أما المبيدان الأخران ميثابنزثيازورون والأيزوبروتورون سجلو تأثيراً أقل على نمو عشبة الجويدار فقد عاش أكثر من ٤٠% من هذه العشبة عند تركيزات مختلفة، بينما لم يتأثر نمو نبات الشعير.

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