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Application of urea as a post-emergence herbicide for pistachio orchards

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SUMMARY – The weeds of a pistachio orchard such as lambsquarters (*Chenopodium album*), camelthorns (*Alhagi camelerum*), hoary cress (*Cardaria draba*), orchardgrass (*Dactylis glomerata*), downy brome (*Bromus tectorum*), bind weed (*Convolvulus arvensis*), velvet leaf (*Abotilon teophrasti*), Russian thistle (*Salsola kali*), kochia (*Kochia scoparin*), black nightshade (*Solanum nigrum*), Mesquite bean (*Prosopis* sp.), continue to be a significant problem in pistachio orchards. In 1999, three trials were carried out in Iran, to assess the herbicidal activity and selectivity of urea in mixture with yolk, instead of herbicides for weed control in pistachio orchards. A randomized complete block design with 4 replications was followed up and sprayed. Data of different treatments for weed control and injury were recorded. Combination treatment of 24% urea and 6% yolk gave excellent control of lambsquarters, camelthorn (green part only), hoary cress, orchardgrass, downy brome, bind weed, velvet leaf, Russian thistle, kochia and black nightshade.

Key words: Pistachio, weeds, urea.

RESUME – *"Application d'urée comme herbicide post-levée dans les vergers de pistachiers". Les mauvaises herbes des vergers de pistachiers telles que* Chenopodium album*,* Alhagi camelerum*,* Cardaria draba, Dactylis glomerata*,* Bromus tectorum*,* Convolvulus arvensis*,* Abotilon teophrasti*,* Salsola kali*,* Kochia scoparin*,* Solanum nigrum*,* Prosopis *sp., continuent d'être un problème significatif dans les plantations de pistachiers. En 1999, trois essais ont été menés en Iran, pour évaluer l'activité herbicide et la sélectivité de l'urée en mélange avec du jaune d'oeuf, au lieu d'herbicides pour le contrôle des mauvaises herbes dans les vergers de pistachiers. Un dispositif aléatoire en blocs complets avec 4 répétitions a suivi avec des nébulisations. Les données des différents traitements de contrôle des mauvaises herbes ainsi que les lésions ont été enregistrées. Un traitement combiné à 24% d'urée et 6% de jaune d'oeuf a permis de bien lutter contre* Chenopodium album*,* Alhagi camelerum*, (parties vertes seulement)* Cardaria draba, Dactylis glomerata*,* Bromus tectorum*,* Convolvulus arvensis*,* Abotilon teophrasti*,* Salsola kali*,* Kochia scoparin *et* Solanum nigrum*.*

Mots-clés : *Pistachier, mauvaises herbes, urée.*

Introduction

Weeds are a product of human society. Contemporary man has created the concept of the weed as a plant in a place where it is not wanted (Ashton *et al.*, 1981). Weed cause heavy losses to the fruit crops by competing for nutrients and water in pistachio orchards. The annual weeds such as lambsquarters (*Chenopodium album*), hoary cress (*Cardaria draba*), orchardgrass (*Dactylis glomerata*), downy brome (*Bromus tectorum*), velvet leaf (*Abotilon teophrasti*), common purslane (*Portulaca oleracea*), Russian thistle (*Salsola* sp.), kochia (*Kochia scoparin*), doorweed (*Polygonum* sp.), flixweed (*Descurainia sophia*), fumitory (*Fumaria* sp.), black nightshade (*Solanum nigrum*), green pigweed (*Amarantus* sp.), prickly lettuce (*Lactuca scariola*), and perennial weeds such as camelthorn (*Alhagi camelerum*), bind weed (*Convolvulus arvensis*), Mesquite bean (*Prosopis* sp.), bermuda grass (*Cynodon dactylon*), johnson grass (*Sorgum hallepens*), (*Sofora* sp.), are the most important weeds in pistachio orchards in Iran.

A wide range of herbicides for weed control in pistachio orchard were tested to find the most effective and a economical one (Black and Meyers, 1966; Geissbuhler *et al.*, 1975; Ashton *et al.*, 1981).

According to Ashton *et al.* (1981) thousands of substituted urea compounds have been tested as herbicides, and many are available for commercial use.

DCU [1,3-bis(2-2-2-trichloro-1 hydroxy ethyl urea)] was the first substituted urea to be used commercially for weed control (Ashton *et al.*, 1981).

In present study urea have been tested for its efficacy for controlling weeds in pistachio orchards.

Materials and methods

The experiment were carried out in spring 1999 in the pistachio orchard of Faizabad, central part of Khorasan, Iran.

A randomized complete block design with 4 replications were used. The weed population of each plot was determined before and after spraying. The treatments were urea at different concentrations + 6% yolk which applied as a post-emergence herbicides.

Observations on weed growth, herbicidal activity and selectivity of sprayed component were recorded.

Results

After one week all the sprayed component reduced the weed growth as compared to the unweeded control. There was a significant differences between treatments and species of weeds.

Best results of weed killing were observed on plots with combined urea 24% and 6% yolk, resulted in dying 85% of all species (Table 1). It was not effective for controlling of camelthorn, velvet leaf, Mesquite bean, johnson grass, flix weed and green pigwood. It causes better growth and vegetation of the mentioned weeds which produced vigorous lateral shoots after 3 weeks.

Table 1. Herbicidal activity of urea on weeds of pistachio orchards spring (1999)

Retardation of growth, progressive chlorosis, and leaf-tip die back	Completely damaged without regrowth	Treatments
Lambsquarters, velvet leaf, bind weed, Russian thistle, camelthorn, Mesquite bean, johnson grass	Hoary cress, orchardgrass, downy brome, common purslane, kochia, doorweed, flixweed, fumitory, black nightshade, green pigweed, prickly lettuce	Urea 24% + 6% yolk
Lambsquarters, velvet leaf, bind weed, Russian thistle, flixweed, camelthorn, Mesquite bean, green pigweed	Hoary cress, orchardgrass, downy brome, common purslane, fumitory, black nightshade, prickly lettuce	Urea 20% + 6% yolk
Orchardgrass, hoary cress, downy brome, fumitory	There was no completely damaged weeds	Urea 12% + 6% yolk

The urea 20% and 6% yolk was found to be the second best treatment in controlling of annual weeds, such as hoary cress, orchard grass, downy brome, common purslane, fumitory, black nightshade and pickly lettuce.

The concentration of 12% of urea not be effective treatment and most of the weeds continued to better growth after a week. It means the urea at this concentration not be used as a herbicides for weed control.

References

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