UNIVERSITY of NOVI SAD, SERBIA
FACULTY of AGRICULTURE

# 22nd International Symposium Food safety production

# PROCEEDINGS

Trebinje, Bosnia and Herzegovina, 19 - 25 June, 2011.

CIP – Каталогизација у публикацији
Библиотека Матице српске, Нови Сад

63:502/504(082)
631.147(082)

**International symposium »Safe food production« (22; 2011; Trebinje)** Procedings / 22nd International symposium »Safe food production« Trebinje, Bosnia and Herzegovina, 19 – 25 June, 2011 ; [editor in chief Milan Krajinović ]. – Novi Sad ; Faculty of Agriculture, 2011 (Novi Sad ;Tampograf). – 537 str. : ilustr. : 25 cm

Tiraž 200. - Bibliografija uz svaki rad.

ISBN 978-86-7520-219-6

а) Здрава храна – Производња – Зборници б) Еколошка пољопривреда – Зборници
COBISS.SR-ID 264465927

**22nd International symposium »Safe food production«**
*22. Međunarodni simpozijum »Proizvodnja zdravstveno bezbedne hrane«*
*Trebinje, Bosnia and Herzegovina, 19 – 25 June, 2011.*

# EFFECT OF FOLIAR APPLICATION OF COBALT ON SEED YIELD AND YIELD COMPONENTS OF RED CLOVER *(Trifolium pratense L.)* VARIETIES

*Stevović, V., Tomić, D., Đurović, D.*[1]

SUMMARY: Seed crops of red clover are generally established on acid soils in which some microelements are less accessible for plants. The field experiment with the varieties of red clover: K-39, K-17, Una, and Viola is set to soil $pH_{H2O}$ 4.8, in order to analyze the impact of foliar application of cobalt, microelements necessary for effective nitrogen fixation, on seed yield and yield components (number of stems $m^{-2}$, number of inflorescences $m^{-2}$, number of inflorescences per stem, number of flowers per inflorescence, number of seeds per inflorescence, fertility and thousand seed weight). Significant differences between cultivars, regardless of foliar cobalt application, were observed for: number of inflorescence per stem, number of flowers per inflorescence, number of seeds per inflorescence, fertility, thousand seed weight and seed yield. Foliar application of cobalt in the phase of intensive growth of shoots, caused positive effect on: number of stems $m^{-2}$, the number of inflorescences $m^{-2}$, the number of flowers per inflorescence and seed yield of the cultivar Viola.

Key words: red clover, cobalt, seed yield, yield components

## Introduction

Given the economic and agro-tehnical importance of red clover *(Trifolium pratense* L.*)*, in the combined production of forage-seed, it is necessary to apply appropriate agro-tehnical practices to the potential for forage and seed yields a maximum realized. Proper mineral nutrition can have a positive effect on seed yield of perennial legumes, especially on acid soils [7]. According to Taylor and Quesenrberry [28], acid soils are characterized by a high presence of easily accessible forms of aluminum, iron and manganese and reduced content of easily accessible phosphorus, calcium, and molybdenum. On acid soils, Al and H inhibited the growth of the root system, reducing its capacity for uptake of mineral nutrients and thereby reduces the resistance of plants to drought [10].

Growth and metabolism of plants to a large extent depend on the concentration of cobalt (Co) in the rhizosphere and soil [23]. Cobalt plant supply is essential for normal range of physiological reactions in the process of photosynthesis [18], breathing [23, 2], cell growth (increasing the amount of active form of auxin) [17], which affects the rapid growth of plant organs [1, 19, 11, 12]. The positive effect of cobalt supply to plants is manifested through increased chlorophyll content [18, 22], increased thickness of palisade tissue, increased number and size of chloroplasts [18].

Cobalt significantly increases nitrogen fixation by Rhizobium-all kinds, and thus the growth of legumes [5]. Co is a component of vitamin B12 that a component of enzymes and coenzymes involved in the process of nitrogen fixation in legume nodule [4, 16, 23, 19].

Given the importance of the supply to leguminous plants Co and its low mobility in the plant [3], the goal was to be chosen genotypes of red clover, to examine the effect of foliar application of Co on seed yield and yield components.

## Material and Method

The experiment was established in 2009 in Čačak (43°54'39.06" N, 20°19'10.21" E, 246m a.s.l.), on the alluvial soil type, $pH_{H2O}$ 4.8, poor in nutrient content, low organic matter content. Along with tillage, the land is entered 300 kg $ha^{-1}$ $N_0P_{15}K_{15}$. Two factorial experiment with four varieties of red clover and two treatments Co. (control, foliar Co) was conducted using a randomized block design with four replications with plot size $5m^2$ (5x1m). Cultivars of red clover: K-17, K-39 (Institute of Forage Crops Krusevac), Una (Institute of Field and Vegetable Crops Novi Sad) and Viola (Poland cultivar) were planted at 20cm row spacing, with the amount of 18 kg seed $ha^{-1}$. Crop foliar treated cobalt (as $Co(NO_3)_2$, the concentration 0.033g l, with the use of water in 1000 L $ha^{-1}$), the first time in the phase of intense growth and the second time before the beginning of flowering. Weed control was done mechanically on two occasions. Crop is grown without irrigation.

Seed yield and yield components were determined from the second cut in the second year of cultivation. Of yield components in the field is determined by: number of stems $m^{-2}$ and number of inflorescences $m^{-2}$ (counting the area of $0.2m^2$ per elementary plot), number of flowers per stem (counting to ten randomly selected stems from elementary plot).

---

Original scientific paper

[1]Vladeta Stevović, PhD, professor, Dalibor Tomić, assistant, Dragan Đurović, assistant, Faculty of Agronomy, Čačak, Serbia. Corresponding author: Dalibor Tomić, Faculty of Agronomy, Cara Dušana 34, 32000 Čačak, Serbia; E-mail: dalibor@tfc.kg.ac.rs; Phone: +381 32 303411.