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RESEARCH ON CHOOSING THE OPTIMAL DOSAGE OF HERBICIDES CEREDIN SUPER (300 g/l 2.4-D + 100 g/l Dicamba) AND ASTRAL 40 SC (Nicosulfuron 40 g/l) APPLIED TO CONTROL WEEDS IN MAIZE CROP

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Abstract

Studies have been conducted for two consecutive years, 2013 and 2014 respectively, in the climatic conditions of Braila Plain. The experience was monofactorial, including six variants in three repetitions, placed on the Latin rectangle method, experimental plot measuring 12.6 square meters and a total area measuring 300sqm. Graduation experimental factor were: V1 (Ceredin Super 0.8 l/ha + Astral 40 SC 0.8 l/ha); V2 (Ceredin Super 1 l/ha + Astral 40 SC 1 l/ha); V3 (Ceredin Super 1.2 l/ha + Astral 40 SC 1.2 l/ha); V4 (Ceredin Super 1.5 l/ha + Astral 40 SC 1.5 l/ha); V5 (untreated) and V6 (hand weeding). Hybrid corn used was PR39D34. Particular sensitivity to weed corn manifested predominantly untreated variant, noticing increasing weed from 89 plants/sqm in 2013 and 92 plants/sqm in 2014, in phase 4-6 leaves of corn, 165 plants/2013 sqm and 169 plants/sqm in 2014, at the end of the vegetation period of maize. Compared to hand weeding were revealed statistically significant two variants, namely V3 (Ceredin Super 1.2 l/ha + Astral 40 SC 1.2 l/ha) and V2 (Ceredin Super 1 l/ha + Astral 40 About 1 l/ha), with an average of weed 81 and 77% in 2013 and 80 and 74% in 2014 compared to control 88% manual weeding. Also, we determined the elements of productivity and yield obtained from each experimental variant compared with untreated variant, and was established correlations between doses of fertilizer and values of productivity elements.

Key words*: maize, weeds control, herbicides doses.*

INTRODUCTION

Maize is very sensitive to weeds, on the one hand because it develops slowly in the first 4-6 weeks and on the other hand because density of plants per square meter is lower than in other cultures. The weed competition can lead to significant loss of harvest, unless the time comes for weed control.

The most effective weed control is with herbicides, but herbicides dose varies depending on the degree of weeds and climatic conditions. Single factor experiment was represented by testing four different doses of herbicides and Astral Super CEREDIN as follows: V1 (CEREDIN Super 0.8 l/ha + Astral 40 SC 0.8 l/ha); V2 (CEREDIN Super 1 l/ha + Astral 40 SC 1 l/ha); V3 (CEREDIN Super 1.2 l/ha + Astral 40 SC 1.2 l/ha); V4 (CEREDIN Super 1.5 l/ha + Astral 40 SC 1.5 l/ha); V5 (hand weeding). Hybrid corn was used PR39D34.

In control of weeds, the main objective has always been throughout the period of vegetation removal of weed competition by reducing pest infestations below the threshold of the consumption of water and nutrients by weeds, ultimately contributing to obtaining high yields and quality appropriate to the level of the biological potential of maize hybrids (Şarpe, 1987; Bârlea & Segărceanu, 1985).

MATERIALS AND METHODS

Experience placement was performed by the method Latin rectangle in three repetitions, experimental plot the surface of 17.5 m^2 (3.5 m x 5 m), 1m wide alleys are the total area of experience being 447 m^2 (Figure 1).

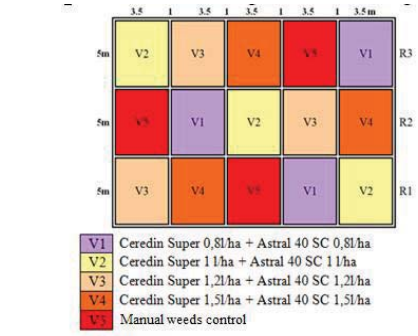

Figure 1. Scheme of experience with different doses of the herbicide for corn and images of experimental field

We determined the degree of weed before treatment, 30 days, 45 days and at harvest each experimental variant. Biometric measurements were made at harvest and were determined yield and production obtained. The results were statistically processed by the method variance (Anova) and correlation method (Trifan & Bularda, 2014).

RESULTS AND DISCUSSIONS

The degree of weed herbicide was raised before, in both experimental years, the 15 weed species occurring in the experience: *Fumaria officinalis, Chenopodium album, Echinochloa crus-galli, Amaranthus retroflexus, Setaria glauca, Cirsium arvense, Galinsoga parviflora, Convolvulus arvensis, Sonchus arvensis, Polygonum lapathyfolium, Sorghum halepense, Agropyron repens, Xanthium strumarium, Atriplex patula and Chenopodium polyspermum* and their average percentage is shown in Figure 2. Particular sensitivity to weed corn manifested predominantly untreated variant, noticing increasing weed average from 89 plants / m in phase 4-6 leaves of corn, 165 plants / m at the end of the vegetation period of maize (Figure 3). The yield was between 82.6% and values 89.5%, the highest value being obtained yield variant V3 (CEREDIN Super 1.2 l/ha + Astral 40 SC 1.2 l/ha), followed in order decreasing the variants V4 (CEREDIN Super 1.5 l/ha + Astral 40 SC 1.5 l/ha) and V6 (manual weeds control) (Figure 4).

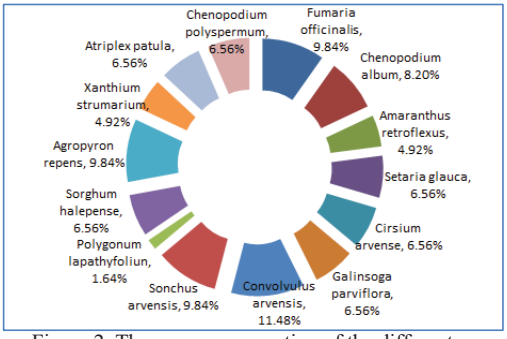

Figure 2. The average proportion of the different species of weeds, in the experience of herbicides in corn, phase of 4-6 leaves of maize (A-2013 B - 2014)

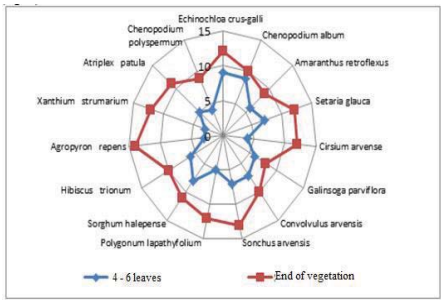

Figure 3. The graph of weeds in untreated variant

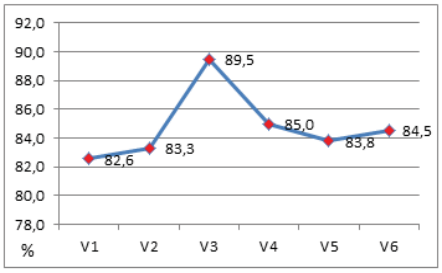

Figure 4. The graph values yield for each experimental variant

Analysis of correlations established between doses of herbicides applied to production and productivity elements values were very significant positive and highlighted in the graphs in Figures 5 and 6.

Explanation of these correlations derived from the corn weed problem, which harms both the ill-fated competition for space nutrition and for being gazed agents of pests and pathogens, which can reduce production quantity and quality of corn.

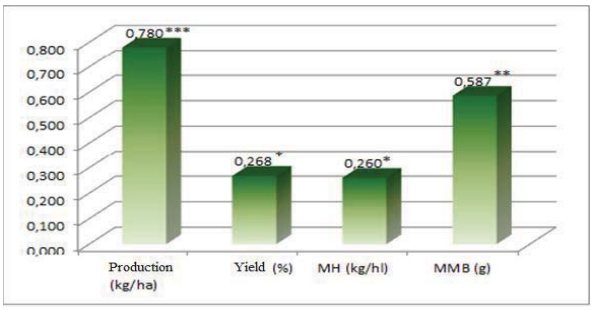

Figure 5. Graph correlations established between doses of herbicides applied and productivity elements

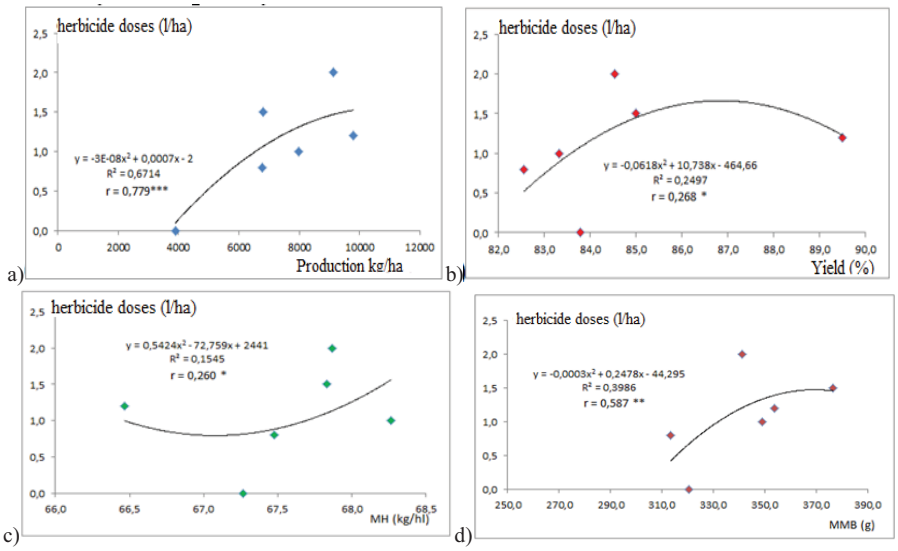

Figure 6. Graphs correlation between doses of herbicides applied to maize production indices (a), the yield of production (b) hectolitre mass (c), thousand grain weight (d)

Compared to alternative weed control by hand hoeing, were found statistically significant two variants, namely V3 (CEREDIN Super 1.2 l/ha + Astral 40 SC 1.2 l/ha) and V4 (CEREDIN Super 1.5 l/ha + Astral 40 About 1.5 l/ha), with an average degree of weed in end vegetation 85 and 90%, compared with the control hand weeding 94% (Figure 7).

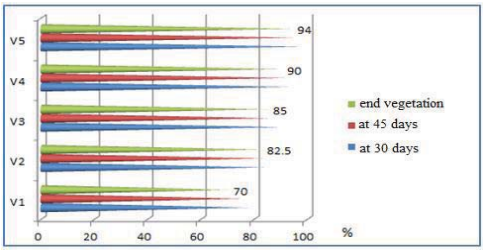

Figure 7. The average degree of weed control

At harvest, and production indices were determined from the number of cobs per plot (17.5 square meters), the mass of the samples taken, the average weight of the cob, the mass of grains per cob, the mass of the rachis, the number of rows/cob, the number of seeds/row, thousand grain weight (MMB), hectolitre mass (MH), yield at STAS humidity.

The average number of cobs/variant was highest in manual hoeing version (V5), followed in descending order of V3 variants (doses of 1.2 l/ha) and V4 (doses of 1.5 l/ha) (Figure 8).

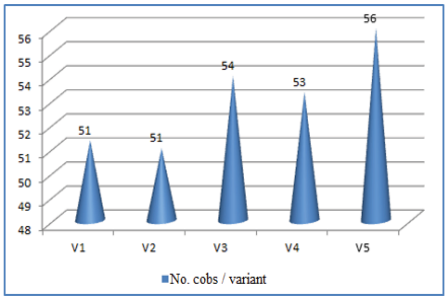

Figure 8. The graph of the average number of cobs / experimental variant (17.5 m^2)

The average weight of the corn cob harvest was the highest in version V4 (dose of 1.5 l/ha), followed by variant V5 (manual weeds control) and V3 version (dose of 1.2 l/ha) (Figure 9).

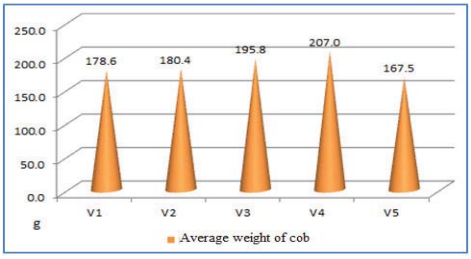

Figure 9. The graph of the average weight values of the ear recorded at harvest

The lowest average number of kernels/row was recorded in variant V1, and the average number of rows/ear lowest was recorded in variant V4. The highest average number of grains per cob was recorded in variant V3, followed in descending order of variants V1 and V5 (Figure 10).

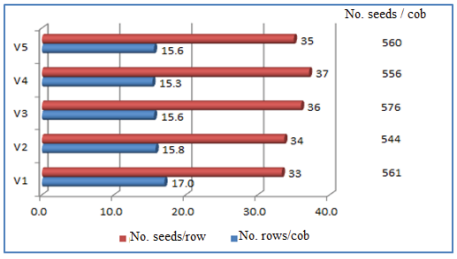

Figure 10. The graph determinations on the number of rows per ear, number of kernels per row and the number of grains per cob variants

Hectolitre mass determinations have shown that manual hoeing variant (witness experience) hectolitre mass was lowest (74.8 kg/hl), followed in ascending order of V3 variants (dose of 1.2 l/ha), V4 (the dose of 1.5 l/ha), V1 (dose of 0.8 l/ha) and V2 (the dose of 1 l/ha) (Figure 11).

Highest production yield, calculated at standard humidity was recorded at hand weeds control variant, followed in descending order by herbicide version 0.8 l/ha and then 1.5 l/ha herbicides version (Figure 13).

Regarding thousand grain weight, the best results were obtained from manual hoeing version (V5), followed in descending order by V4 version (1.5 l/ha) and variant V1 (1 l/ha) (Figure 12).

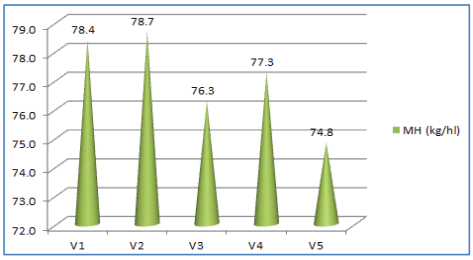

Figure 11. The graph of hectolitre mass average in experimental variants

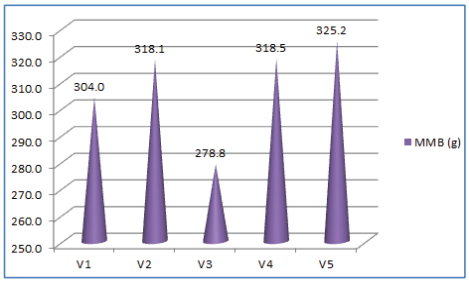

Figure 12. The graph of MMB (thousand seed weight) of experimental variants

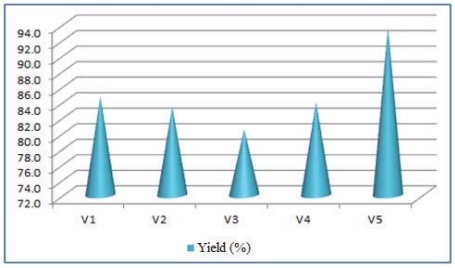

Figure 13. The graph yield of maize production in the experience of herbicides in crop year 2013-2014

Average grain yields, calculated at 15.5% humidity STAS for maize, the experience obtained values ranged from 4807 kg/ha and 5788 kg/ha and yield differences between experimental variants compared to the control manual weeding were significantly herbicides version only positive at 1.5 l/ha, followed by a dose of 1.2 l/ha, which means that a higher dose of herbicide was more economically efficient than manual weed control (Figure 14).

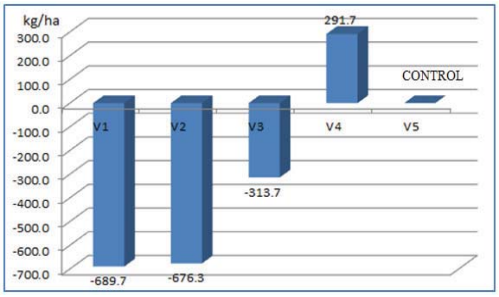

Figure 14. Differences of corn production in herbicides experience, compared to manual weed control

CONCLUSIONS

It can be concluded that the application of a herbicide in higher dose is more effective compared to manual weeding, but the dilution of herbicide must to be correctly calculated, in correlation with the state of soil moisture and air, so as not to produce toxicity in plants to the crop being treated.

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