

5th International Conference "Agriculture for Life, Life for Agriculture"

Research for identifying the optimal strategy of weed control and fertilization on wheat crop

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Abstract

Wheat is considered the most important crop, with a high content in protein and carbohydrates, and by balance between them. Grains can be transported and preservation for long term without difficulty, and have a high ecological plasticity, being cultivated in areas with different climates and soils; full mechanization of cultural opportunities, the plant occupies large areas of cultivation. Weed control is the main work of the wheat crop technology. The yield losses due to weedness are from 10 to 70%. The control of weed in the wheat crop is mandatory, at this time the offer of herbicides at the market is very big and the problem for farmers is to choose the optimum strategy. For identifying the optimal strategy for control of weeds in wheat crop in 2014-2015 was performed a bifactorial trial where factor A - weed control with 8 graduations (a_1 - untreated, a_2 - Laren 60WG; a_3 - Logran 20WG; a_4 - Harmony 75DF; a_5 - Lintur 70 WG; a_6 - Sekator; a_7 - Dicopur Top 464 SL; a_8 - Rival Star 75 GD), and factor B - level of nitrogen fertilization with two graduations (b_1 - unfertilized, b_2 - fertilization with 150 kg of nitrogen/ha). After results analysis, it was found that the greatest degree of weed control was registered on Logran 20WG where the weedness degree was 8.1% at harvest and the yield level was 2610 kg/ha at b_1 unfertilized and 4325 kg/ha at b_2 - 150 N kg/ha. Applying of fertilization has as result increasing of yield with more than 1000 kg/ha.

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Peer-review under responsibility of the University of Agronomic Sciences and Veterinary Medicine Bucharest

Keywords: weed; weed control; herbicides; fertilization; wheat; production.

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1. Introduction

The present paper assesses the financial efficiency when applying rotation and fertilization, in the Crop Rotation Field at Moara Domneasca Experimental Farm, which was founded in 1981.

Wheat is considered the most important crop, with high share in food. Due to the high content of protein and carbohydrates and grains in the ratio of these requisite human body; Long-term preservation of grains and that can be transported without difficulty, have a high economic plasticity, being cultivate climates and soils in areas with very different; the possibility of full mechanization of culture, plant cultivation occupies large areas. Weed control is the primary care work of culture wheat. Weeds are one of the major constraints in wheat production because they reduce productivity due to competition, allelopathy, providing habitats for microbes and serving as alternative host various insects and fungi and increased costs at harvest (Abbas et al., 2009; Bekelle, 2004).

Studies have indicated that crop losses due to weed competition throughout the world as a whole, are greater than those resulting from the combined effect of insect pests and diseases determined 10-65% reduction in wheat yield. (Gezu and Soboka, 2001).

However, choosing the most appropriate herbicide, corresponding time of application and the appropriate dosage is an important element for lucrative profits (Abbas et al., 2009; Khalil et al., 2008; Marwat et al., 2008; Sherawat et al., 2005).

Weed infestation are among the factors leading to low yields (Cheema and Farooq, 2007).

Weeds reduce crop yields by competing for not only necessary growth factors such as water, nutrients, light and space, but also by releasing chemicals in the rhizosphere through their roots or other plant parts (Reddy, 2000).

On the other hand, chemical weed control dependence only involves an excessive use of herbicides, which results in environmental pollution and the inter- and intra-specific exchange (Hassan and Marwat, 2001).

Weed management by physical and mechanical work involving the animals and implementation costs, making them more laborious, tedious and expensive (Iqbal, 1994).

2. Materials and Methods

In order to achieve objectives, investigations were conducted both field and laboratory. The research in the field were conducted during the growing season and were aimed at determining selectivity and efficacy of herbicides, the weeds and the degree of quantitative and qualitative obtained. Applying herbicides recommended optimal era was achieved by producers when the soil is at least 10 °C before formation of the first internode. Emission mixture was 300 l/ha. The surface of experimental plots was 30 m². All variants have benefited from the same works agrophytotechnical.

Experience was mounted on cernoziom soil in farm II. Iavnic Adrian. The reaction is slightly alkaline soil with pH values of 6-6.5 and 46% humus.

Sunflower plant was prior. The wheat variety was cultivated a kind Hungarian Justus, acquired from Agricover company. Sowing was done with drills SUP 29, with a density of 50 grains germinable/m² distance between rows of 12,5cm. Emergence it has been found on 18 October 2014. In autumn plowing was applied under 70 kg/ ha P₂O₅.

There were used the pre-emergence treatment, all treatments were applied post-emergence spring; Twinning I internode wheat, weed in roset fase.

Experience was placed after the type bifactorial subdivided parcels method, where:

- Factor A - nitrogen fertilization with two graduations: a₁-50 kg nitrogen/ha, a₂-150 kg nitrogen/ha.
- Factor B - Weed management with eight graduations (Table 1).

Determination of weed (numeric) was done before treatments and that two weeks after their application and before harvest.

Based on data collected to determine participation, where:

m = the average number of weeds/m² of a given species,

M = the average number of weeds/m, the sum of all media weed species identified.

Constance is calculated using the formula where the number of points where a species was present and N the total number of points where measurements were made (in this case they were made 20 determinations) .

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