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# THE STUDY ON METHODS OF COMBATING WEEDS FROM RED CLOVER CULTURE IN THE CONDITIONS OF SATU MARE COUNTY

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## ABSTRACT

*The researchcarried out in the 2020-2021 agricultural year on the red clover crop aimed to establish the effectiveness of herbicide sapplied in pre-emergenceand post-emergence on the floristic composition and the influence of herbicide treatments on production. The experiment was located at SCDA Livada, Satu Mare county, on a stagnogleyized preluvosol with a pH of 5.19, a clay content of 20.9% and a humus content of 2.82%.*

## INTRODUCTION

Red clover is an important perennial legume for humid hilly areas, which effectively capitalizes on the acid and moderately acid soils of Transylvania, Moldova and the north of the Romanian Plain, it is an alternative for creating a biodiversity among crop plants with a major role for improving the quality of fodder, ameliorating soils and reducing pollution through the low need for synthetic substances (Borza & Stanciu 2010, Mondici & Fritea 2016, Mondici et al. 2016). The remaining symbiotic nitrogen can provide 40-50% of the nitrogen required for the subsequent crops (Fritea et al., 2012, Mondici et al., 2017).

The small areas of land intended for the production of red clover seed in non-irrigated conditions require, in order to satisfy the demands, the improvement of the culture technology, in such a way as to ensure, year after year, the realization of large and constant seed productions per surface unit (Fritea et al. 1995, Giurgiulescu et al. 2015)

Our country, located in the center of the red clover cultivation area, meets extremely favorable conditions for very high productions of green mass or hay (Moisa & Smit, 2021, Mondici 2016).

Achieving high forage production is the key to solving the problem of animal nutrition (Domuţa & Sabău 2001, Mondici & Fritea 2015). And in this sector of agriculture, herbicides have an important rolein obtaining large harvests of good quality fodder - because the presence of weeds in fodder reduces production per hectare, greatly depreciates their quality, and some of them are very toxic for various animal species (Brejea 2010, Varga et al. 1998).

## MATERIAL AND METHODS

The experiments were located according to the randomized block method, 9 variants in 3 repetitions, the surface of the plot being 21 square meters.

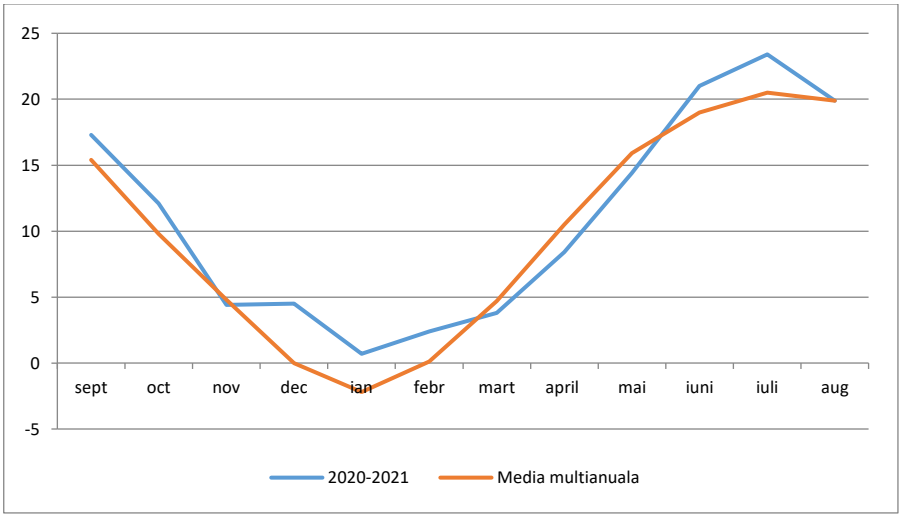


Figure 1. Monthly and multiannual temperatures (°C) Livada 2021

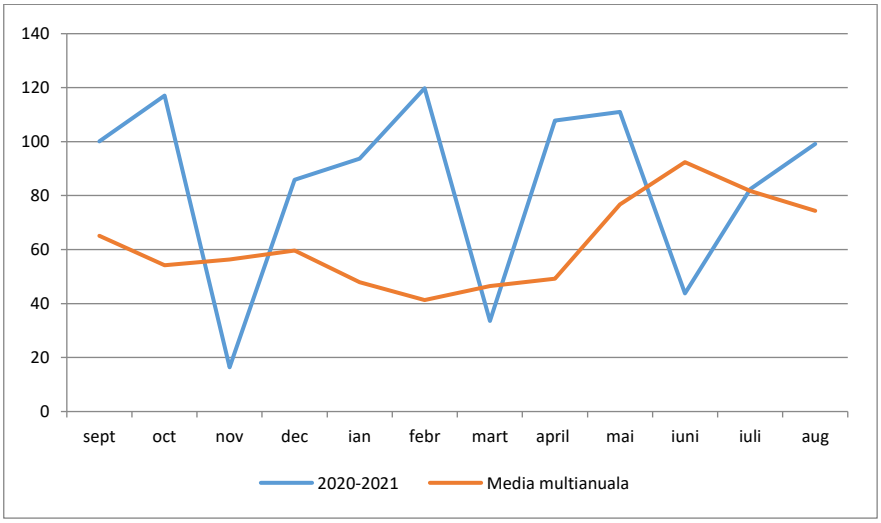


Figure 2. Monthly and multiannual precipitation (mm) Livada 2021

In the Orchard, during this period, from sowing (September 9, 2020) until the onset of winter (November 1, 2020), 10270C and 233 mm of precipitation accumulated, which ensured optimal conditions for the formation of 1-2 short shoots at the entrance in winter.

We are witnessing a warm autumn and winter, temperatures above normal values (Fig. 1) (+1.9°C in September, +2.3°C in October, +4.5°C in December

+2.9°C in January, +2.3°C in February, deviations from the multiannual average) associated with a period of rains (+35mm in September +62.9mm in October), favored the emergence and formation of clover plants for entering the Winter. The months of March, April and May of 2021 have values below the multi-year averages in terms of the thermal regime. The rains in May of 111 mm, 34.3 mm above the multi-year average, after the first green mass scythe, created favorable conditions for the formation of the second green mass scythe and the seed scythe (Fig. 2).

## RESULTS AND DISCUSSIONS

The floristic composition of the weeds present in the experience placed in thered clover culture was: *Viola arvensis*, *Capsella bursa pastoris*, *Matricaria inodora*, *Stellaria media*, *Cirsium arvense*, *Sonchus arvensis*, *Brassica napus* (rapeseedmustard), Triticum (wheat mustard).

The herbicide sused in the experiment are shown in table 1.

Table 1

Herbicide application scheme for the first year red clover crop

| No. Crt. | Erbicide | Doza l,kg/ha | Substanţa activă |
|---|---|---|---|
| 1 | Dual Gold 96 EC + Kerb 50W | 1,0 + 3,0 | S – metolaclor 960/g + propyzamid 50% |
| 2 | Leopard 5 EC +Kerb 50W | 1,5+3,0 | quizalofop- p-etil 50g/l + propyzamid 50% |
| 3 | Dual Gold 96 EC + Basagran Forte | 1,0+2,0 | S – metolaclor 960/g +bentazon 480g/l + wettol (adj.) |
| 4 | Leopard 5 EC + Basagran Forte | 1,5+2,0 | quizalofop- p-etil 50g/l+ bentazon 480g/l + wettol (adj.) |
| 5 | Dual Gold 96 EC + Pulsar 40 EC | 1,0+1,2 | S – metolaclor 960/g + imazamox 40g/l |
| 6 | Leopard 5 EC + Pulsar 40 EC | 1,5+1,2 | quizalofop- p-etil 50g/l + imazamox 40g/l |
| 7 | Dual Gold 96 EC +Corum | 1,0+1,25 | S – metolaclor 960/g + bentazon480g/l + imazamox22,4g/l |
| 8 | Leopard 5 EC+ Corum | 1,5+1,25 | quizalofop- p-etil 50g/l + bentazon480g/l + imazamox22,4g/l |
| 9 | Untreated | - | - |

The era of herbicide application was pre-emergence (immediately after sowing) and post-emergence (when the clover reaches 3-4 leaves).

During the growing season, after the treatments, observations were made regarding the degree of selectivity and effective ness on weeds.

The selectivity of the test edherbicides against the red clover crop was scored following visual observations according to the EWRS scale (grades from 1 to 9; 1=selectivity, 9=phytotoxicity).

Through the statistical analysis of production differences, it is found that the variant streated with Leopard 5 Ec 1.5l/ha + Basagran Forte 2l/ha applied in post-emergence and Dual Gold 96 EC 1l/ha + Pulsar 1.2l/ha applied in pre-emergence and post-emergence bring distinctly significant increases in production compared to thelevel of 5.92q/ha achieved in the control variant. Significantly positive production

differences are ensured for the variants treated with Dual Gold 96 EC 1l/ha + Kerb 3kg/ha and for the variant treated with Dual Gold 96 EC 1l/ha + Corum 1.25l/ha.

Positive production differences are also ensured by the other varieties treated with herbicides, but not statistically guaranteed (Table 2).

Table 2

The influence of herbicide treatments on production in the 2021 red clover crop

| Nr. Var | Erbicide | Doza l,kg/ha | Epoca de aplicare | Producția q/ha | Diferenţa +/- faţă de Mt | Semnificația |
|---|---|---|---|---|---|---|
| 1 | Dual Gold 96 EC + Kerb 50W | 1,0 + 3,0 | preem | 7,46 | 1,54 | x |
| 2 | Leopard 5 EC +Kerb 50W | 1,5+3,0 | preem+post | 7,33 | 1,41 | |
| 3 | Dual Gold 96 EC + Basagran Forte | 1,0+2,0 | preem+post | 6,92 | 1,0 | |
| 4 | Leopard 5 EC + Basagran Forte | 1,5+2,0 | post | 8,13 | 2,21 | xx |
| 5 | Dual Gold 96 EC + Pulsar40 EC | 1,0+1,2 | preem+post | 8,13 | 2,21 | xx |
| 6 | Leopard 5 EC + Pulsar40 EC | 1,5+1,2 | post | 6,35 | 0,43 | |
| 7 | Dual Gold 96 EC +Corum | 1,0+1,25 | preem+post | 7,73 | 1,81 | x |
| 8 | Leopard 5 EC+ Corum | 1,5+1,25 | post | 6,96 | 1,04 | |
| 9 | Untreated | - | - | 5,92 | - | |

DL 5% = 1,51q/ha 1% = 2,07q/ha 0,1% = 2,85q/ha

The evaluation of the effective ness was do neby counting the weeds by species per 1 square meter in each variant before the first mowing.

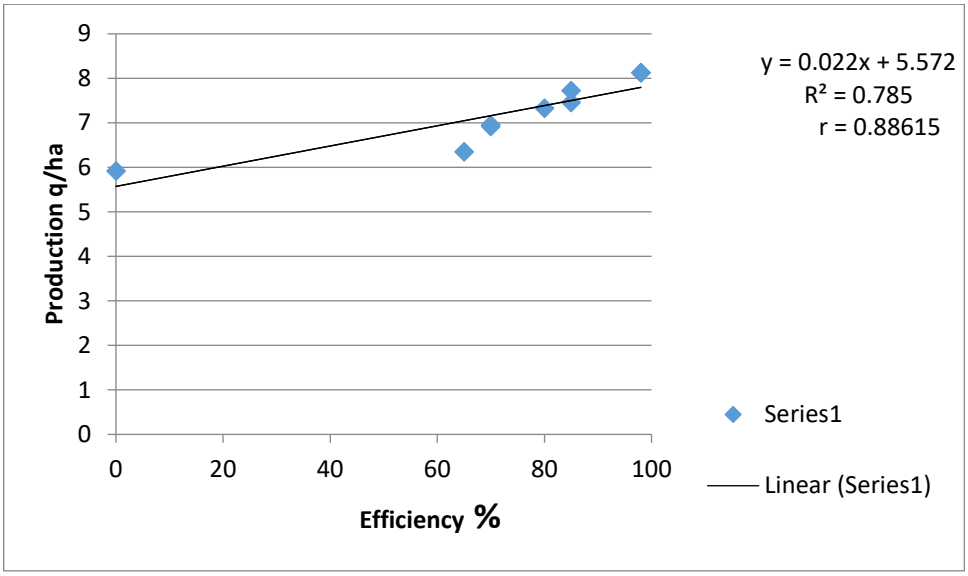


Figure 3. The relations hipbet weent heef fectiveness of the treatments and the production of red clover year I

Analyzing the effectiveness of herbicides in year I redclover, it is observed that thereis a close correlation betwee neff ectiveness and production (Fig. 3).

## CONCLUSIONS

The experience was located in Satu Mare county at the Livada Agricultural Development Research Station, on an acid soil, in the 2020-2021 agricultural year.

The dominant weed species in red clover culture were: Viola arvensis, Capsella bursa pastoris, Matricaria inodora, Stellaria media, Cirsiumarvense, Sonchusarvensis, Brassicanapus (rapeseed mustard), Triticum (wheat mustard).

The selectivity of the herbicide saga instred clove r was very good, thes coreac cording to the EWRS scale being 1.

Efficacy ranged from 65 to 98%.

Increases in production were obtained with each treated variant, but statistically ensured were thevariants treated with: Leopard 5 Ec 1.5l/ha + Basagran Forte 2l/ha, Dual Gold 96 EC 1l/ha + Pulsar 1.2l/ha , Dual Gold 96 EC 1l/ha + Kerb 3kg/ha and in the variant treated with Dual Gold 96 EC 1l/ha + Corum 1.25l/ha.

Based on the results obtained, the bests trategies for fighting weeds in the red clover culture can be established.

## REFERENCES

Borza I. A., Stanciu, Şt. 2010. Fitotehnie. Editura Universităţii Oradea.

Brejea R. 2010. Ştiinţa solului – îndrumător de lucrări practice. Editura Universităţii din Oradea.

Domuţa C., Sabău N.C. 2001. Agrotehnică partea I, partea II. Editura Universităţii din Oradea.

Fritea T., Păcurar I., Goga N. 1995. Influenţa lucrărilor solului şi a tratamentelor chimice asupra buruienilor şi bolilor la grâul de toamnă. Lucrările solului – present şi viitor. Simpozion Cluj-Napoca, 373-380.

Fritea T., Nagy D., Mondici S. 2012. Combaterea buruienilor din cultura grâului cu erbicidul Pallas 75 WG. Oferta Cercetării Ştinţifice pentru transfer tehnologic în agricultură, industria alimentară și silvicultură, vol. XV, 74-75

Giurgiulescu L., Daraban M., Stoica F., Banica M. 2015. Comparative Study Regarding the Chemical Composition of Sparckling Wines Obtained by Different Methods. Analele Universitatii din Craiova Biologie Horticultura Tehnologia Prelucrarii Produselor Agricole Ingineria Mediului, vol. XX (LVI), Editura Universitaria, 151-156.

Moisa F., Smit G. 2021. Crearea de noi genotipuri de trifoi roșu cu perenitate crescută și conținut ridicat de proteină cu rezistență la secetă și arșiță și cu capacitate mai mare pentru producerea de sămânță. Cercetare și performanță în agricultură SCDA Livada Nr.6, 5-12.

Mondici S., Fritea T. 2016. Soluții de combatere a buruienilor, testate la SCDA Livada, pentru principalele culture agricole. Cercetare și performanță în agricultură SCDA Livada Nr.1, 43-44.

Mondici S. 2016. Cercetări privind influenţa tipului de sol asupra compoziţiei floristice a buruienilor. Analele Universităţii din Oradea, Fascicula Protecţia Mediului, vol. XXVI, 45-52.

Mondici S., Fritea T., Brejea R. 2016. Cercetări privind protecţia culturilor împotriva buruienilor efectuate la SCDA Livada. Analele Universităţii din Oradea, Fascicula Protecţia Mediului, vol. XXVII. 47-54.

Mondici S., Fritea T., Brejea R. 2017. Cercetări privind eficacitatea tratamentelor cu erbicide la cultura grâului pe trei tipuri de sol în zona de nord-vest a României. Analele Universităţii din Oradea, Fascicula XXVIII, 71-76.

Mondici S., Fritea T. 2015. Combaterea buruienilor din cultura grâului în zona de Nord-Vest a ţării. Oferta Cercetării Ştinţifice pentru transfer tehnologic în agricultură, industria alimentară şi silvicultură vol. XVIII, 50-51.

Varga P., Moisuc Al., Schitea M., Olaru C., Dragomir N., Savatti M. Jr. 1998. Ameliorarea plantelor furajere și producerea semințelor. Editura Lumina.