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# Effects of Shepherd's Purse (*Capsella bursa pastoris* (L.) Medic.) on the Chemical Composition of Lucerne (*Medicago sativa* L.)

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**SUMMARY**

A study was conducted in a pure stand of lucerne (variety Viktoria) under natural weed infestation with shepherd's purse (*Capsella bursa pastoris* (L.) Medic.) on a slightly leached chernozem soil under nonirrigated conditions in the experimental field of the Institute of Forage Crops – Pleven during the 2006-2007 period.

The effect of shepherd's purse *Capsella bursa pastoris* (L.) Medic. on the chemical composition of lucerne *Medicago sativa* (L.) was analyzed.

Statistically significant ($P<0.05$) functional relations were found between the chemical characteristics and percentage of *Capsella bursa pastoris* (L.) Medic. participation in the lucerne sward, and forage quality. These relations indicated a multiple practical relevance and a necessity to control *Capsella bursa pastoris* (L.) Medic. in lucerne stands in order to decrease weed density and improve forage quality.

**Keywords:** *Medicago sativa* (L.); *Capsella bursa pastoris* (L.) Medic.; Chemical composition; Forage quality

## INTRODUCTION

Full expression of lucerne's biological potential and its continuing use depend on degrees of weed infestation of its stands. Some authors (Fabri, 1974; Leonard, 1974; Cummings et al., 2004) consider the competitive effects of weeds uppermost among the factors infuencing the relatively short life of a crop.

Cords (1973), Temme et al. (1979), Mueller and Fick (1987), Undersander et al. (1993) and Dillard et al. (2004) found in their studies that the competitive effect of weeds in lucerne stands influenced the chemical composition of forage crop, as well as its palatability.

Shepherd's purse (*Capsella bursa pastoris* (L.) Medic.) of the group of annual dicotylenous weeds (Kolev, 1963; Čuturilo and Nikolić, 1986) is a permanent weed infesting old lucerne stands with highest densities. The weed was included in the approved list of economically important weeds in the Republic of Bulgaria belonging to a group of virus hosts. It causes inflammatory processes in monogastric animals (Yakimova, 1979) and greatly decreases the quality of herbaceous forage (Temme et al., 1980). *Capsela bursa pastoris* is an aggressive weed with regard to vital factors influencing lucerne development. It creates a necessity to control the weed in order to secure pure stands, improve their botanical composition and increase their productivity (Peters, 1984; Waddington, 1985; Dimitrova, 2001). As a result of efficient control of this weed, an increase of 29-31% has been achieved in dry biomass (Dimitrova, 2007) and 19-42% in seed productivity (Dimitrova, 2005).

Producers of lucerne forage have a good reason to raise the question of the weed's negative effect not only in terms of quantity, but the quality of produced forage as well, and a necessity to control the weed.

The objective of this study was to determine the effect of shepherd's purse *Capsella bursa pastoris* (L.) Medic. on the chemical composition of lucerne *Medicago sativa* (L.).

## MATERIAL AND METHODS

The study was conducted in a pure stand of lucerne (variety Viktoria) with a natural weed infestation with shepherd's purse (*Capsella bursa pastoris* (L.) Medic.) on a slightly leached chernozem soil under nonirrigated conditions in the experimental field of the Institute of Forage Crops – Pleven over the 2006-2007 period. To determine the chemical composition of aboveground biomass in the sward, three average samples of 500 g fresh biomass containing different quantity ratios of lucerne and weed were collected (Table 1), fixed at 110°C temperature and dried to constant weight at 63 ± 2°C.

Sampling for the analysis was performed at an early flowering stage of lucerne, immediately before harvesting of the first cut for forage. The content of several major elements was determined using methods developed by the following authors: phosphorus – Gericke and Kurmis (after Sandev, 1979); calcium – Sandev (1979); crude protein (CP) content – conventional method of Kjeldahl (after Sandev, 1979) after determination of nitrogen content by formula: CP = N x 6.25; dry matter, crude fibres and crude ash – methods suggested by Sandev (1979).

The experimental data were statistically processed by the STATGRAPHICS Plus software for Windows Version 2.1. Correlation (Spearman rank correlation coefficient, *r*) (Aavit, 2005, Freckleton et al., 2008), and regression analyses of all studied characteristics were performed to determine the effect of different proportion percentages of shepherd's purse on the chemical composition of lucerne.

Linear function $Y = f(x_1, x_2, x_{3....}x_n)$ for open biological systems, known also as the method of Wit (1966), was used to determine the effect of shepherd's purse on the studied characteristics depending on its percentage in the lucerne stand. At the base of the model, the effect of the weed percentage was recorded depending on the kind of lucerne sward for the factors with significantly strongest influence, using variables in the regression equations: $Y$ – percentage of shepherd's purse participation in lucerne stand; $x_1$ – dry matter; $x_2$ – crude protein; $x_3$ – crude fibres; $x_4$ – Ca; $x_5$ – P; $x_6$ – crude ash.

**Table 1.** Experimental variants
**Tabela 1.** Varijante eksperimenta

| Variants<br>Varijante | Participation of lucerne and shepherd's purse in lucerne sward, %<br>Učešće lucerke i rusomače u usevu lucerke, % | |
|---|---|---|
| | *Medicago sativa* (L.) | *Capsella bursa pastoris* (L.) Medic. |
| A | 100 | 0 |
| B | 0 | 100 |
| C | 90 | 10 |
| D | 80 | 20 |
| E | 70 | 30 |
| F | 60 | 40 |
| G | 50 | 50 |
| K | 40 | 60 |
| L | 30 | 70 |
| M | 20 | 80 |
| N | 10 | 90 |

## RESULTS AND DISCUSSION

One can assess the harmful influence of *Capsella bursa pastoris* (L.) Medic. based on its participation in a lucerne stand by performing chemical analysis of the cuts.

The ranges of variation in the chemical composition of cuts made in the lucerne sward, depending on percentages of *Capsella bursa pastoris* (L.) Medic. participation, differed significantly. Crude protein, crude ash and Ca contents decreased disproportionately – from 3 to 47% with the increase in shepherd's purse presence in the lucerne sward. Crude fibre and P contents in lucerne increased by 6-49%, while the content of dry biomass did not differ significantly, as against the check variant – A (Tables 1 and 2).

The results of a correlation analysis showed statistically significant relations between the studied characteristics depending on the percentage of *Capsella bursa pastoris* (L.) Medic. participation in lucerne for variants *A, C, D, E, F, G, K, L, M* and *N*. Positive and negative correlations between the studied characteristics were found, the correlation coefficient $r_{\text{Spearman}}$ varying from 0.730 to 0.976 and from -0.559 to -0.937, respectively, and being statistically significant at $P<0.05$ (Table 3).

**Table 2.** Chemical analysis of lucerne depending on the participation of *Capsella bursa pastoris* (L.) Medic.
**Tabela 2.** Hemijska analiza lucerke u zavisnosti od učešća *Capsella bursa pastoris* (L.) Medic.

| Variants Varijante* | Dry biomass Suva masa | % | Crude proteins Sirovi proteini | % | Crude fat Sirova mast | % | Ca | % | Phosphorus Fosfor | % | Crude ash Sirovi pepeo | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 94.70 | 100 | 22.70 | 100 | 15.97 | 100 | 2.271 | 100 | 0.139 | 100 | 10.61 | 100 |
| B | 94.51 | 100 | 15.09 | 66 | 26.97 | 169 | 1.198 | 53 | 0.122 | 88 | 7.19 | 68 |
| C | 94.70 | 100 | 22.08 | 97 | 17.61 | 110 | 2.038 | 90 | 0.124 | 89 | 9.75 | 92 |
| D | 94.84 | 100 | 19.06 | 84 | 21.13 | 132 | 1.825 | 80 | 0.135 | 97 | 9.08 | 86 |
| E | 94.16 | 99 | 18.04 | 79 | 23.24 | 146 | 1.764 | 78 | 0.137 | 99 | 8.81 | 83 |
| F | 94.42 | 100 | 18.77 | 83 | 20.53 | 129 | 1.719 | 76 | 0.139 | 100 | 8.98 | 85 |
| G | 94.40 | 100 | 16.51 | 73 | 23.71 | 148 | 1.441 | 63 | 0.130 | 94 | 8.17 | 77 |
| K | 94.69 | 100 | 16.79 | 74 | 23.50 | 147 | 1.575 | 69 | 0.148 | 106 | 8.06 | 76 |
| L | 94.39 | 100 | 17.12 | 75 | 23.36 | 146 | 1.696 | 75 | 0.121 | 87 | 8.80 | 83 |
| M | 93.85 | 99 | 16.47 | 73 | 23.29 | 146 | 1.258 | 55 | 0.134 | 96 | 7.63 | 72 |
| N | 93.46 | 99 | 16.98 | 75 | 23.73 | 149 | 1.211 | 53 | 0.135 | 97 | 7.59 | 72 |

*variants as in Table 1; % - percentage against the check variant, i.e. lucerne stand free of *Capsella bursa pastoris* (L.) Medic.
*varijante kao u tabeli 1; % - procenat u odnosu na kontrolu, tj. lucerku bez prisustva vrste *Capsella bursa pastoris* (L.) Medic.

**Table 3.** Correlations ($r_{Spearman}$) between the studied characteristics in lucerne sward depending on *Capsella bursa pastoris* (L.) Medic. participation.
**Tabela 3.** Korelacije ($r_{Spearman}$) između proučavanih karakteristika u usevu lucerke u zavisnosti od prisustva vrste *Capsella bursa pastoris* (L.) Medic.

| Characteristics Karakteristike | Variants – Varijante | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *A, C, D, E, F, G, K, L, M* and *N* | | | | | | *B, C, D, E, F, G, K, L, M* and *N* | | | | | |
| | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ |
| $X_1$ | - | 0.596 | -0.559 | 0.730 | 0.346 | 0.730 | - | 0.321 | -0.285 | 0.467 | 0.207 | 0.454 |
| $X_2$ | | - | -0.879 | 0.915 | 0.463 | 0.915 | | - | -0.879 | 0.915 | 0.517 | 0.915 |
| $X_3$ | | | - | -0.927 | -0.445 | -0.939 | | | - | -0.927 | -0.492 | -0.939 |
| $X_4$ | | | | - | 0.463 | 0.976 | | | | - | 0.511 | 0.976 |
| $X_5$ | | | | | - | 0.384 | | | | | - | 0.438 |
| $X_6$ | | | | | | - | | | | | | - |

$x_1$ - dry biomass; $x_2$ - crude proteins; $x_3$ - crude fibres; $x_4$ - Ca; $x_5$ - P; $x_6$ - crude ash
$x_1$ - suva masa; $x_2$ - sirovi proteini; $x_3$ - sirova biljna vlakna; $x_4$ - Ca; $x_5$ - P; $x_6$ - sirovi pepeo

**Table 4.** Effect of participation of *Capsella bursa pastoris* (L.) Medic. in lucerne stand on the chemical composition of above-ground biomass
**Tabela 4.** Efekat učešća *Capsella bursa pastoris* (L.) Medic. u usevu lucerke na hemijski sastav nadzemnog dela biljne mase

| Variants Varijante | Characteristics Characteristics | $y = a + b.x$ | Se | r | $R^2$ | Pl | $y = a + b.\sqrt{x}$ | Se | r | $R^2$ | Pl |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| *A, C, D, E, F, G, K, L, M* and *N* | $X_1$ | $y = 496.7 - 5.2.x$ | 2.14 | -0.745 | 0.555 | <0.05 | $y = 986.0 - 100.9.\sqrt{x}$ | 2.14 | -0.745 | 0.555 | <0.05 |
| | $X_2$ | $y = 27.7 - 1.2.x$ | 1.63 | -0.861 | 0.742 | <0.01 | $y = 50.2 - 10.2.\sqrt{x}$ | 1.61 | -0.866 | 0.749 | <0.01 |
| | $X_3$ | $y = 12.6 + 0.9.x$ | 1.85 | 0.818 | 0.669 | <0.01 | $y = -29.9 + 7.9.\sqrt{x}$ | 1.86 | 0.814 | 0.663 | <0.01 |
| | $X_4$ | $y = 20.7 - 8.5.x$ | 1.26 | -0.920 | 0.846 | <0.01 | $y = 34.8 - 21.9.\sqrt{x}$ | 1.26 | -0.920 | 0.847 | <0.01 |
| | $X_5$ | $y = 26.6 - 148.1.x$ | 3.01 | -0.352 | 0.124 | <0.10 | $y = 46.9 - 109.5.\sqrt{x}$ | 3.00 | -0.356 | 0.126 | <0.10 |
| | $X_6$ | $y = 31.8 - 2.9.x$ | 1.38 | -0.902 | 0.814 | <0.01 | $y = 57.8 - 17.4.\sqrt{x}$ | 1.36 | -0.906 | 0.821 | <0.01 |
| *B, C, D, E, F, G, K, L, M* and *N* | $X_1$ | $y=477.7-5.0.x$ | 2.31 | -0.694 | 0.481 | <0.05 | $y = 948.2 - 97.0.\sqrt{x}$ | 2.31 | -0.694 | 0.482 | <0.05 |
| | $X_2$ | $y =16.5-0.6.x$ | 3.00 | -0.359 | 0.129 | <0.10 | $y = 25.9 - 4.6.\sqrt{x}$ | 3.01 | -0.344 | 0.118 | <0.10 |
| | $X_3$ | $y =1.1+ 0.2.x$ | 3.15 | 0.193 | 0.037 | <0.10 | $y = -5.4 + 2.5.\sqrt{x}$ | 3.13 | 0.218 | 0.048 | <0.10 |
| | $X_4$ | $y =13.8-4.6.x$ | 2.89 | -0.437 | 0.191 | <0.10 | $y = 20.4 - 11.1.\sqrt{x}$ | 2.91 | -0.423 | 0.179 | <0.10 |
| | $X_5$ | $y = 4.9+12.0.x$ | 3.21 | 0.033 | 0.001 | <0.10 | $y = 3.15 + 9.15.\sqrt{x}$ | 3.21 | 0.034 | 0.001 | <0.10 |
| | $X_6$ | $y =11.8-1.35.x$ | 3.00 | -0.358 | 0.128 | <0.10 | $y = 28.3 - 7.5.\sqrt{x}$ | 3.01 | -0.346 | 0.120 | <0.10 |

*Y* - percent participation of *Capsella bursa pastoris* (L.) Medic. in the lucerne stand; $x_1$ - dry matter; $x_2$ - crude protein; $x_3$ - crude fiber; $x_4$ - Ca; $x_5$ - P; $x_6$ - crude ash; *Se* - Standard error; *r* - correlation coefficient; $R^2$ - regression coefficient; *Pl* – P - level of significance

| $y = a + b.1n(x)$ | Se | r | $R^2$ | Pl | $y = e^{(a + b.x)}$ | Se | r | $R^2$ | Pl | $y = a.x^b$ | Se | r | $R^2$ | Pl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) | (23) | (24) | (25) | (26) | (27) |
| $y = 2231.4 - 489.3.\ln(x)$ | 2.14 | -0.745 | 0.554 | <0.05 | $y = e^{(83.3 - 0.87.x)}$ | 0.43 | -0.678 | 0.459 | <0.05 | $y = 5.08.x^{-81.5}$ | 0.43 | -0.677 | 0.459 | <0.05 |
| $y = 71.9 - 22.5.\ln(x)$ | 1.59 | -0.869 | 0.755 | <0.01 | $y = e^{(6.0 - 0.23.x)}$ | 0.21 | -0.935 | 0.874 | <0.01 | $y = 2.32.x^{-4.44}$ | 0.21 | -0.936 | 0.876 | <0.01 |
| $y = - 46.9 + 12.4.\ln(x)$ | 1.88 | 0.810 | 0.656 | <0.01 | $y = e^{(-2.1 + 0.2.x)}$ | 0.26 | 0.901 | 0.813 | <0.01 | $y = 0.0001.x^{+3.55}$ | 0.26 | 0.901 | 0.811 | <0.01 |
| $y = 13.5 - 14.0.\ln(x)$ | 1.27 | -0.918 | 0.844 | <0.01 | $y = e^{(4.4 - 1.6.x)}$ | 0.21 | -0.933 | 0.871 | <0.01 | $y = 2.06.x^{-2.5}$ | 0.25 | -0.909 | 0.827 | <0.01 |
| $y = - 33.8 - 20.2.\ln(x)$ | 3.00 | -0.359 | 0.129 | <0.10 | $y = e^{(5.4 - 26.6.x)}$ | 0.55 | -0.346 | 0.120 | <0.10 | $y = 0.004.x^{-3.64}$ | 0.55 | -0.353 | 0.125 | <0.10 |
| $y = 62.6 - 26.0.\ln(x)$ | 1.34 | -0.909 | 0.826 | <0.01 | $y = e^{(6.6 - 0.6.x)}$ | 0.20 | -0.938 | 0.880 | <0.01 | $y = 220575.x^{-4.9}$ | 0.21 | -0.933 | 0.870 | <0.01 |
| $y = 2145.9 - 470.5.\ln(x)$ | 2.31 | -0.694 | 0.482 | <0.05 | $y = e^{(76.8-0.8.x)}$ | 0.47 | -0.603 | 0.364 | <0.10 | $y = 5.3.x^{-74.9}$ | 0.47 | -0.604 | 0.364 | <0.10 |
| $y = 33.6 - 9.4.\ln(x)$ | 3.04 | -0.327 | 0.107 | <0.10 | $y = e^{(3.1-0.1.x)}$ | 0.57 | -0.261 | 0.068 | <0.10 | $y =161.0.x^{-1.2}$ | 0.57 | -0.220 | 0.048 | <0.10 |
| $y = - 13.5 +6.4.\ln(x)$ | 3.12 | 0.242 | 0.058 | <0.10 | $y = e^{(1.3+0.02.x)}$ | 0.59 | 0.081 | 0.006 | <0.10 | $y = 0.69.x^{+0.68}$ | 0.58 | 0.139 | 0.019 | <0.10 |
| $y = 9.4 - 6.6.\ln(x)$ | 2.93 | -0.409 | 0.168 | <0.10 | $y = e^{(2.69-0.5.6.x)}$ | 0.57 | -0.278 | 0.077 | <0.10 | $y = 7.9.x^{-0.71}$ | 0.57 | -0.240 | 0.058 | <0.10 |
| $y = 10.0 + 1.74.\ln(x)$ | 3.21 | 0.036 | 0.001 | <0.10 | $y = e^{(0.56+0.9.x)}$ | 0.58 | 0.134 | 0.012 | <0.10 | $y = 66.80.x^{+1.22}$ | 0.58 | 0.138 | 0.002 | <0.10 |
| $y = 28.8 - 10.5.\ln(x)$ | 3.03 | -0.333 | 0.111 | <0.10 | $y = e^{(2.9-0.1.x)}$ | 0.58 | -0.202 | 0.041 | <0.10 | $y = 46.7.x^{-0.98}$ | 0.58 | -0.171 | 0.029 | <0.10 |

*Y* - procenat učešća *Capsella bursa pastoris* (L.) Medic. u zasadu lucerke; $x_1$ - suva masa; $x_2$ - sirovi proteini; $x_3$ - sirova biljna vlakna; $x_4$ - Ca; $x_5$ - P; $x_6$ - sirovi pepeo; *Se* - standardna greška; *r* - koeficijent korelacije; $R^2$ - koeficijent regresije; *Pl* – P - nivo značajnosti

Analogous with them were the results obtained from the correlation analysis $r_{\text{Spearman}}$ of the studied factors in variants *B, C, D, E, F, G, K, L, M* and *N* (Table 3). An exception was observed only in dry biomass / Ca, and dry biomass / crude ash interrelations, where $r_{\text{Spearman}}$ ranged 0.454-0.467, being statistically nonsignificant.

The data on the effect of shepherd's purse percent participation in the lucerne stand (Table 1), obtained after application of different functional relations, is presented in Table 4.

The results of the regression analysis showed functional linear relations $y = a + b.x_{1\div 6}$ in the variants *A, C, D, E, F, G, K, L, M* and *N* (Table 1) and the studied characteristics, coefficients of correlation ($r$) and determination ($R^2$), as follows: $x_1$ – dry matter $r$ = -0.745, $R^2$= 0.555 (P<0.05); $x_2$ – crude proteins $r$ = -0.861, $R^2$ = 0.742 (P<0.01); $x_3$ – crude fibres $r$ = 0.818, $R^2$ = 0.669 (P<0.01); $x_4$ – Ca, $r$ = -0.920, $R^2$= 0.846 (P<0.01); $x_6$ – crude ash $r$ = -0=902, $R^2$= 0.814 (P<0.01). An exception was observed only in the content of phosphorus, where the corresponding values were $r$ =-0.325 and $R^2$ = 0.124 and statistically nonsignificant.

These regularities were also confirmed by comparison of the coefficients of regression ($R^2$) and correlation ($r$), using functional relations of the following kind: $y = a + b.\sqrt{x}$; $y = a + b.h(x)$; $y = e^{(a+b.x)}$; $y = a.x^b$, where $r$ ranged from +0.810 to +0.901 and from -0.677 to -0.938, and $R^2$ from 0.459 to 0.880 (P<0.01).

The statistical analysis of data showed close functional relations of the following kind: $y = f(x_1,x_2,x_3)$ between dry matter ($x_1$), crude proteins ($x_2$), crude fibres ($x_3$), Ca ($x_4$) and crude ash ($x_6$), and different participation percentage of shepherd's purse in the lucerne stand ($y$) in the variants *A, C, D, E, F, G, K, L, M* and *N* (Table 1). The relation can be expressed with the equation: $y=321.403 - 2.719.x_1 - 1.5.x_2 - 0{,}846.x_3 + 2{,}831.x_4 - 1.857.x_6 \pm 0.782$; $R^2$ =0.889, statistically significant at P<0.05

The performed regression and correlation analyses in the variants *A, C, D, E, F, G, K, L, M* and *N* (Tables 1 and 4) did not show functional relations with regard to crude proteins ($x_2$), crude fibres ($x_3$), Ca ($x_4$), P ($x_5$) and crude ash ($x_6$) – $r$ varied from 0.033 to -0.437 and $R^2$ was within a range from 0.001 to 0.1191 (P<0.10), being also statistically nonsignificant. An exception was observed only in dry matter ($x_1$) and in functional relations of the following kind: $y = a + b.x$; $y = a + b.\sqrt{x}$ and $y = a + b.h(x)$; and where $r$ was -0.694 and $R^2$ varied from 0.481 to 0.482 at (P<0.05).

The used regression models described well the interrelations between the studied characteristics that proved lucerne forage quality to be dependent on the participation of the two components (lucerne and shepherd's purse) in the sward. The negative effect of *Capsella bursa pastoris* (L.) Medic. on chemical composition indicated a need for weed control. Efficient herbicides for treatment of old lucerne stands in nonvegetation periods have been established (Dimitrova, 2001, 2007).

## CONCLUSIONS

The degree of effect of shepherd's purse (*Capsella bursa pastoris* (L.) Medic.) on the chemical composition of lucerne (*Medicago sativa* L.) can be determined by using a linear function for open biological systems.

Statistically significant (P<0.05) functional relations were found between chemical characteristics and percent participation of *Capsella bursa pastoris* (L.) Medic. in the lucerne sward, and forage quality $y=321.403 - 2.719.x_1 - 1.5.x_2 - 0{,}846.x_3 + 2{,}831.x_4 - 1.857.x_6 \pm 0.782$; $R^2 = 0.889$.

These relations have practical importance in various respects, substantiating a necessity to conduct control against *Capsella bursa pastoris* (L.) Medic. in lucerne stands in order to decrease population density of the weed, as well as to improve forage quality.

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# Delovanje rusomače (*Capsella bursa pastoris* (L.) Medic.) na hemijski sastav lucerke (*Medicago sativa* L.)

**REZIME**

Tokom perioda 2006-2007. godine obavljeno je istraživanje na eksperimentalnom polju Instituta za krmno bilje u čistom zasadu lucerke (varijetet Viktoria) sa prirodnom zakorovljenošću rusomačom (*Capsella bursa pastoris* (L.) Medic.) na blago izluženom černozemu u uslovima bez navodnjavanja.

Analiziran je efekat rusomače *Capsella bursa pastoris* (L.) Medic. na hemijski sastav lucerke *Medicago sativa* (L.).

Konstatovani su statistički značajni ($P<0,05$) funkcionalni odnosi između hemijskih osobina i procenta učešća *Capsella bursa pastoris* (L.) Medic. u lucerki, i kvaliteta krmiva. Ovi odnosi ukazuju na višestruku praktičnu važnost i potrebu suzbijanja vrste *Capsella bursa pastoris* (L.) Medic. u lucerki kako bi se smanjila gustina korova i poboljšao kvalitet krmiva.

**Ključne reči:** *Medicago sativa* (L.); *Capsella bursa pastoris* (L.) Medic.; hemijski sastav; kvalitet krmiva