INTRODUCTION

Potato is of great importance for the Montenegro economy and, according to the planted areas, represent the leading agricultural crop. It accounts for about 25% of the production on arable land. The main regions intended for potato production for storage and consumption during the autumn and winter are located in the central and mountainous regions of the country. Potato yields in Montenegro are very low (about 15 t ha⁻¹) and highly dependent on weather conditions. In addition, to the direct effects of climate change (high temperatures, droughts and excessive rainfall during the growing season), there are number of other factors that are affecting such productivity state, of which, in importance, stand out: relatively small use of certified planting material, limited use of irrigation, potato cultivation in low monoculture, diseases and pests and poor agronomic practices, especially poor nutrient management. In order to improve the situation in this production, besides favourable agro-ecological conditions, more intensive application of agro-technical measures will be necessary, especially irrigation and fertilization.

MATERIAL AND METHODS

The trial was set up as three-factorial in a randomized block design in four replications during 2015 and 2016, in the mountainous area of Montenegro (Municipality of Kolašin), at an altitude of 900 m, on acid-brown soil. The preceding crop in both years was a natural meadow. Plowing was done in the fall, along with the application of rotted farmyard manure and calcification. The manual planting of potatoes (Kennebec variety) was carried out at a distance of 70x30 cm, with density of 43300 plants per hectare. The size of the elemental plot was 21 m². During the growing season, standard agrotechnical measures for potatoes were applied.

The results shown in table 1 show that in 2015 the largest number of tubers was determined in the variants a₁-a₂ -6.18, 6.18 and 6.10, and lowest in treatment a₁ - 5.8. The number of tubers in variants a₁ and a₂ was statistically significantly higher compared to all mineral fertilizer treatments, except for the combination applied in variant a₁. In 2016, the highest number of tubers per potato plant was found in treatments a₁, a₂ and a₁ - 7.20, 7.12 and 7.00, respectively. The increase in the average number of tubers in the plots fertilized with these fertilizers compared to all other variants, except variant a₁ - 7.00 was statistically justified.

The largest tubers in 2015 were measured in the variant a₁-a₂, while the lowest average weight had plants grown in the variant a₁ - 79.7 g. The increase in the average weight of tubers in the a₁ treatment in comparison with all other methods of fertilization was marked as statistically significant. In 2016, as in the previous year, the highest average weight of tubers was measured in the treatment a₁ - 101.0 g, while the smallest tubers had plants grown in the variant a₁ - 79.7 g. In both research years, the a₁ variant (27.6 t ha⁻¹ in 2015 and 34.8 t ha⁻¹ in 2016) yielded significantly higher tuber yields compared to all other mineral fertilizer variants. At the same time, the lowest yields were in potato plants grown on treatment a₁ (22.0 t ha⁻¹ in 2015 and 24.8 t ha⁻¹ in 2016).

Fertilization with rotted farmyard manure had a very positive effect on the potato crop. In both studied years, significantly higher values were achieved for all studied parameters of potato productivity in variants fertilized with organic fertilizer (average number of tubers 6.2 in 2015 and 7.14 in 2016, average tuber weight 86.2 g in 2015 and 94.9 g in 2016 and tuber yield 26.7 g in 2015 and 32.2 t ha⁻¹ in 2016) compared to plots without its application (average number of tubers 5.85 in 2015 and 6.68 in 2016, average tuber weight 81.5 g in 2015 and 83.1 g in 2016 and tuber yield 22.5 g in 2015 and 26.3 t ha⁻¹ in 2016).

The application of liming significantly increased the average tuber weight and yield in both studied years. The average weight of tubers in limed plots was 82 g in 2015 and 84.5 in 2016, and in non-limned variants 79.2 g and 81.7 g, respectively. This caused the yield of tubers in lime plots (23.3 t ha⁻¹ in 2015 and 27.2 t ha⁻¹ in 2016) to be higher than in the control variant (21.9 t ha⁻¹ in 2015 and 25.5 t ha⁻¹ in 2016). Differences in the average number of tubers per plant between limed (5.9 in 2015 and 6.77 in 2016) and non-limned plots (5.8 in 2015 and 6.6 in 2016) were without statistical significance.

CONCLUSION:

The results of these studies confirm that the liming in combination with organic and mineral fertilizers, through soil pH optimization and neutralization of soil acidity, as well as better availability of nutrients, has a positive impact on potato yield and other parameters of potato productivity. The combined application of mineral fertilizers, rotted farmyard manure and liming significantly affected the increase in average tuber number, average tuber weight and total tuber yield.