This paper presents the results obtained from an experiment placed on temporary meadows, in south region of Moldavian plain, created by sowing a mix of Onobrychis viciifolia Scop. (esparcet) and Bromus inermis Leiss. (brome grass) in different proportions. Microbiologic activity of the temporary grassland soil was studied, under the influence of fertilizations with an unconventional product (Vinassa Rompak - 3% N, 0.5% P, 7% K, pH 7-8), and with different doses of organic and chemical fertilizers. The objectives of this investigation were to isolate and quantify the microbial population existent in soil (Gram positive bacteria, Gram negative bacteria, micromycete and the nitrogen-fixing bacteria) establishing their participation ratio, the main fungus genres which activate in soil and their activity level for each variant. The results illustrate the influence of the fertilization on the total number of microorganisms, on the relationship between the main groups (bacteria and fungi), and on the micromycetes spectrum determined in each variant of our experiment.