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Sowed Pastures in the South-Eastern Romanian Plain

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

The objective of this study was the identification of the mixtures with elite traits to provide some high-quality fodders, in adequate quantity in the tilled areas sowed in large pastures. Previously, most farms in this area used to cultivate only alfalfa, which is the most important fodder crop in the area. Lately, pastures have been sown with mixtures of Graminaceae and Leguminous varieties, which have superior fodder values. This is possible as these varieties are better adapted to the natural conditions specific to the area. Three mixtures of perennial fodder varieties made of two Graminaceae crops (*Dactylis glomerata* and *Festuca arundinaceea*) and two leguminous crops (*Medicago sativa* and *Trifolium repens-Ladino*) were tested with different mixtures for the years 2016-2019. The results obtained in the first year of harvest (2016) characterised by the climatic conditions over the area showed that the average medium annual production of the three mixtures reached the value of 88.7 t/ha, and this was same as the yield obtained by only alfalfa fodder crop (*M. sativa*). The highest yield was achieved with the first two harvests resulting over 60% of the total yield. The non-uniformity of the climatic factors during the vegetation period leads to a non-uniform distribution of the yield on reapings. Also, the yield obtained with the the third mixture was low (84 t/ha) as a consequence of the lower adjustment capability of white trefoil (*T. repens*) to the droughty climatic conditions.

Keywords: Artificial pasture; sowed pastures; temporary pasture.

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1. INTRODUCTION

A few centuries ago, the South-Eastern part of Romania was covered with large grass areas which were characteristic to steppe area and equivalent to savanna, prairie, and pampas [1]. Mixed cropping, also known as polyculture, intercropping, or co-cultivation, is a type of agriculture that involves planting two or more plants simultaneously in the same field, interdigitating the crops so that they grow together. In general, the theory is that planting multiple crops at once saves space, since crops in the same field might ripen at different seasons, and provides a wealth of environmental benefits. Documented benefits of mixed cropping include the balance of input and outgo of soil nutrients, the suppression of weeds and insect pests, the resistance of extreme climatic conditions (wet, dry, hot, cold), the suppression of plant diseases, the increase in overall productivity and the management of scarce resources (land) to the fullest degree [2]. Agronomists studying mixed crops have had mixed results determining if yield differences can be achieved with mixed versus monoculture crops. For example, a combination of wheat and chickpeas might work in one part of the world, but it might not work in another area. However, overall it appears that measurably good effects are obtained when the right combinations of crops are grown together. Mixed cropping is best suited for small-scale farming where harvesting is done by hand. It has been used to improve the income and food production for small farmers and lessen the likelihood of total crop failure-even if one of the crops fail, the same field might still produce the other crop successfully [3-4]. Mixed cropping also requires fewer nutrient inputs such as fertilisers, pruning, pest control and irrigation than monoculture farming. There seems to be no doubt that the practice provides a rich biodiversified environment, fostering habitat and species richness for animals and insects such as butterflies and bees. Some evidences suggest that polycultural fields do produce higher yields compared to monocultural fields in certain situations, and almost always increase biomass richness over time. Polyculture in forests, heathlands, grasslands, and marshes has been particularly important for the regrowth of biodiversity in Europe. A recent study (Pech-Hoil and colleagues) was conducted on the tropical American perennial achiote (*Bixa orellana*), a rapidly growing tree that has a high carotenoid content, and is used as food dye and spice in small farming cultures in Mexico. In this experiment achiote was grown in different agronomic systems, such as-intercropped polyculture, backyard cultivation including poultry farming, and a wide range of plants, and monoculture. Achiote adapted its mating system depending on the type of planting system, specifically the amount of outcrossing. Further research is required to identify the factors for the yield [5-7]. As these large field areas have been sown with specific agricultural crops, the areas left with the initial vegetation (steppe) diminished significantly below 5% [8]. These areas generally consist river meadows that cross the area or with areas provided with a high natural slope which don't allow mechanised agricultural works [9-11]. The results of previous studies showed that the production potential of these steppe natural pastures is very low [12-14]. For this reason, in order to meet the need of local herbivorous animals with necessary fodders, even larger areas from the cropped area (tillable area) have been sown with fodder mixtures consisting of perennial Graminaceae and leguminous varieties with superior fodder value and high production potential. To this end, different types of Graminaceae and leguminous mixtures have been tested within specific research programs, and the best adapted to specific natural conditions of the area have been considered. The objective of this study was the identification of the pasture with this elite traits and meeting this major practical important desideratum.

2. MATERIALS AND METHODS

The research was done in the experimental didactical field of Moara Domnească, Ilfov country, agricultural farm of USAMV Bucharest. The harvest was done in 2015 and the experiment was started in the same year. Three mixtures of perennial fodder varieties (Graminaceae and leguminous) made of two Graminaceae crops (*Dactylis glomerata* and *Festuca arundinaceea*) and two leguminous crops (*Medicago sativa* and *Trifolium repens-Ladino*) were tested with participation shares in different mixtures (Table 1). The mixtures were maintained and exploited according to the technological norms specific to these crop areas. The mixtures with *Medicago sativa* (1 and 2) were used only by threshing, while mixture number 3 with *Trifolium repens – Ladino*, was more appropriate to harvest by grazing. The presence of *Festuca arundinceea* varieties in the 2nd and the 3rd mixtures was aimed to test its good adjustment to the droughty climatic conditions specific to the area.

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