

The Role of Legumes in the Productivity of Pastures in Tajikistan



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Submission: October 17, 2025; Published: November 06, 2025

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Keywords: Leguminous plants; Organic fertilizers; Natural pasture grasslands; Mountain meadows; Ecological conditions

Opinion

Nitrogen-fixing leguminous plants have been successfully used to provide grassland with nitrogen, and pastures are in good condition. In New Zealand, white clover (*Trifolium repens*) is capable of fixing up to 450-550kg/ha of nitrogen per year. In Australia, annual clover seeds are sown on the surface of the soil of the pastures until the plants emerge, while small animals graze and the grassland is provided with the necessary amount of phosphorus by applying mineral and organic fertilizers [1].

In the Republic of Tajikistan, legumes play an important role in the structure of natural pasture grasslands. They are one of the largest families in the flora of Tajikistan, comprising 55 genera and 550 species. Legumes of the genus *Onobrychis*, *Vicia*, *Trifolium*, *Glycyrrhiza* are dominant plants in pastures, or in combination with legumes and forbs, they improve the composition and quality of forage in pastures. The presence of legumes in the pasture and forage grasslands improves the nutritional value of forage plants. In natural pastures, species of the genus *Medicago*, *Lathyrus*, *Vicia*, *Trifolium*, *Astragalus*, *Onobrychis*, *Trigonella* are of great nutritional importance. Many types of legumes are good food, honey plants and medicinal plants.

The results of experiments on the introduction and cultivation of wild legumes in the Southern, Central and Northern regions of Tajikistan and the Western Pamirs indicate the great prospects for the cultivation of wild legumes in various ecological conditions. Promising species for the improvement of winter and spring pastures of Southern Tajikistan were identified, and it was recommended that leguminous food plants are valuable for cultivation and growing in degraded pastures. Thus, the wild

legumes plants of the Western Pamirs were studied in detail in nature and cultivation, and useful recommendations were made. During the study of natural pastures of Southern Tajikistan (Khovaling district), a number of annual leguminous plants were identified and recommended for the improvement of pastures.

In order to introduce them into natural pastures, in different regions, the biological characteristics, productivity and chemical composition of local populations of the species *Medicago orbicularis*, *M. rigidula*, *M. minima*, *M. lupulina*, *M. sativa*; *Onobrychis pulchella*, *O. ferganica*, *O. seravschanica*; *Vicia villosa*; *Astragalus rutilobus* and others were studied. In general, a review of the results of numerous studies shows that wild legumes of the natural flora are the richest source of valuable fodder crops [2-4]. Annual and perennial species of legumes are widely distributed from the plains and subalpine hills to the mid-mountainous and highlands of Tajikistan, and several species of the genus *Medicago* and *Lathyrus* are of phytocenotic importance.

In the intermontane plains and near-mountainous hills and foothills of Southern and Central Tajikistan, savanna-like vegetation, low-growing ephemeral and ephemeroid plants and tall sedges, as well as low-growing woodlands and warm-season shrubs (shiblyak vegetation) prevail. Their grasslands include annual legumes: *Astragalus rutilobus*, *Lathyrus aphaca*, *Vicia sativa*, *V. hyrcanica*, *V. villosa*, *Onobrychis pulchella*, *Trifolium karatavicum*, *Trigonella geminiflora*; perennials - *Medicago sativa*, *Onobrychis ferganica*, etc. are widespread.

It is important to note that annual wild legumes in natural pastures significantly increase the productivity and nutritional value of forage grass, and are green manures, as well as good

natural organic matter for providing the soil with nitrogen. It has been determined that 1 ton of dry mass of legumes enters the soil with 10-12kg of nitrogen. If legumes make up 35-40% of the productivity of pastures, the use of nitrogen fertilizers on these lands is not necessary.

In the savanna-like grassland and warm-season forest (shiblyak) of South Tajikistan, in favorable years, *Astragalus rytlobus* and *Onobrychis pulchella* are the dominant plants of the spring and annual pasture plant community. These species have high nutritional value. In favorable climatic conditions, they reach a height of *Astragalus rytlobus* up to 100cm (usually 5-40cm), and *Onobrychis pulchella* up to 140cm (15-75cm). These plants make dense and productive grasslands, which are used for the production of clover. However, the productivity of savanna-like grasslands of the *Carex pachystilis+Poa bulbosa* community with *Astragalus rytlobus* and savanna-like tall sedge grasslands and meadows - the *Elytrigia trichophora+Hordeum bulbosum* community with *Onobrychis pulchella* community is 3-5

times higher than in degraded grasslands in which these plants have disappeared. Similar results have been obtained with the inclusion of some *Vicia* species in the grasslands of savanna-like tall grass grasslands, mountain meadows and steppe pastures.

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DOI: [10.19080/IJESNR.2025.35.556431](https://doi.org/10.19080/IJESNR.2025.35.556431)

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