An interest in lucerne for pastures has recently arisen, in parallel with a greater concern for a sustainable development in agriculture and a better profitability of marginal areas, where little agronomic alternative exists to grazing of sheep or adapted cattle. Grazing can be a strategic exploitation of forage resources in particular environments and livestock systems, and lucerne may represent an important tool available to producers, owing to the positive attributes possessed by this legume species. This is particularly relevant to farms with organic livestock production, where options for grazing are of paramount importance. The major constraint to an increasing development of lucerne pastures has been represented by the poor persistence of traditional cultivars under common grazing systems. In recent years, a better understanding has been achieved of morphological and physiological mechanisms underlying the tolerance to grazing of lucerne, such as the presence of a deep-set crown, a decumbent growth habit, the ability to accumulate underground reserves, and a sideways spreading ability through creeping roots or underground rhizomes. While starting this selection programme, a large germplasm collection of the Medicago sativa complex was assembled and evaluated for morpho-physiological features. Unlike other breeding programmes, we attempted to categorise the observed plants into distinct "models", based on their morphology and vigour, and we definitely distinguished between creeping-rooted and rhizomatous plants. Genotypes preliminarily selected for their positive features were polycrossed "by model" and entered the next phase of selection. Given the outstanding difficulty of fixing the creeping-rooted character, due to the complex genetic control of this trait, a parallel activity is being carried out, aiming at selecting molecular markers associated to the character, to be used in the marker-assisted selection of creeping-rootedness in lucerne. Meanwhile, rhizomatous progenies belonging to different models, with habit varying from prostrate to semi-erect and vigour from low to moderately high, were evaluated in Lodi, northern Italy, under actual grazing by sheep. Continuous stocking and intensive grazing were applied, as recommended for an effective screening and selection for grazing tolerance by the North American Alfalfa Improvement Conference (NAAIC) standard test. After a two-year assessment of grazing tolerance with reference to the behaviour of a tolerant and an intolerant check variety, the most promising germplasm was selected and assembled into six experimental cultivars (EC), three of which with narrow genetic base and three with broad genetic base. One EC has prostrate habit, three have semi-prostrate habit, and two have semi-erect habit. The six EC were further evaluated for two years under similar conditions of continuous stocking and intensive grazing by sheep. Five of the six EC showed a final persistence similar to, or better than, that of the tolerant check variety. In particular, the prostrate EC (provisionally termed ‘Camporegio’) had outstanding persistence. Another, semi-erect EC (provisionally termed ‘Verbena’) emerged from this evaluation work, possessing a good balance between grazing tolerance, potential dry-matter yield and seed yield (these yields being assessed in separate plots).
After the necessary steps, this germplasm is meant to be released as the first case of grazing-tolerant lucerne cultivars selected in Italy.