

DEVELOPMENT OF ALFALFA CULTIVARS ADAPTED TO BRAZILIAN TROPICAL CONDITIONS

D. H. Basigalup¹, R. de Paula Ferreira² y A. Odorizzi¹

¹ EEA INTA Manfredi (Cba), Argentina - ² EMBRAPA Pecuária Sudeste, São Carlos (SP), Brazil

In the world, Brazil is the main beef producer and one of the most important milk producers under grazing conditions, using about 100 million ha of tropical grasses and 80 million ha of tropical natural pastures; however, it only grows 30,000 ha of alfalfa, mostly concentrated in the South. An increase in alfalfa usage would allow not only to improve animal production due to a better feeding quality, but also to reduce feeding costs, particularly on milk production. Among the factors that are preventing alfalfa expansion in the country, the availability of cultivars adapted to tropical conditions (especially acidic, low fertility soils and specific pests) is likely the most prevalent. The objective of this paper is to describe the process that is being followed at EMBRAPA Pecuária Sudeste, São Carlos, SP, for developing alfalfa cultivars adapted to the Brazilian conditions using interpopulation and intrapopulation breeding methods.

For the **interpopulation** approach, ninety-one commercial cultivars were evaluated under field, cutting conditions. Seed was provided by INTA Manfredi, Argentina. Using a 20-cutting yield data, the experimental line LE N 4 (Palo Verde, Argentina) and the cultivars P30 (Palaversich, Argentina), Crioula (Brazilian ecotype), Bárbara SP INTA (INTA-Produsem, Argentina) and 5715 (Pioneer, USA) were identified as the most productive, with a 1.6 to 1.9 Mg DM ha⁻¹ cut⁻¹ range. In addition, LE N 4 was least affected by diseases, followed by P30 and Crioula. Seed of LE N 4, P30, Crioula, Bárbara and 5715 were mixed in equal proportions and planted to a 100-m² experimental field as isolated plants (10 plants m⁻¹ of row with rows 1-m apart). The best 200 plants, selected by vigor and tolerance to foliar diseases, were transplanted to a pollination cage (honey bees) to produce Syn-1 seed. The Syn-3 seed (to be obtained in 2012/13) will be evaluated for yield and persistence on a multi-location network. As a result, a new cultivar will be hopefully registered in a near future.

Crioula, a widely adapted Brazilian cultivar/ecotype, was used as the base for the **intrapopulation** approach. A 5-ha field of Crioula was conducted under direct grazing (dairy cows) for three years; then, utilizing a stratified mass phenotypic selection, in which the best four plants from each of the 50 sectors that the nursery was divided, the most 200 vigorous and persistent plants were selected and transplanted to a pollination cage. Using honey bees as pollinators, the Syn-1 seed was obtained. The Syn-3 seed (to be obtained in 2012/13) will be evaluated for yield and persistence on a multi-location network. As a result, an improved version of Crioula will be hopefully registered in a near future.

A trial was also conducted to explore the potential for alfalfa **seed production** in the tropic using LE N 4 at a seeding rate of 1 kg ha⁻¹ of viable seeds with rows 1-m apart (10 plants m⁻¹ of row). Soil was corrected applying 5 Mg ha⁻¹ of lime (dolomitic), 80 kg ha⁻¹ of P₂O₅, 100 kg ha⁻¹ of K₂O, and 30 kg ha⁻¹ of micronutrients (FTE BR-12). Seeds were also inoculated with the local rhizobia strain SEMIA 116. Herbicides Imazetapir (1 l ha⁻¹) and Fluazifop-p-butyl (1.5 l ha⁻¹) were applied for weed control. Based on ET estimations, sprinkling irrigation was provided as needed. Five honey bees m⁻² were used as pollinators. The experimental units were 20 3-m² plots scattered over a total area of 0.2 ha. Seed production was carried out in the dry season (May to September) and plots were harvested when at least 80% of the pods turned to dark-brown color. For the first year, it was obtained an average yield of 421 kg ha⁻¹, indicating an interesting potential for the Central area of São Paulo State.