Sunn Hemp Augments Cool-Season Perennial Forage Production in Summer

Dormancy and low productivity of cool-season perennial forages, such as tall fescue, during summer necessitates the identification of warm-season forages that increase nutritive value and yield of cool-season-based forage systems. A fast-growing, warm-season tropical legume, sunn hemp (Crotalaria juncea L.), has the potential to accomplish this.

In the January–February 2019 issue of *Crop Science*, researchers report on a two-year study conducted during the summer growing seasons (July–September) of 2014 and 2015 at the Bradford Research Center, University of Missouri, Columbia where herbage accumulation, nutritive value, and regrowth potential of sunn hemp were evaluated under low-input systems.

Researchers found that nutritive value and herbage accumulation of sunn hemp can be optimized by initially harvesting between 35 and 45 days after planting and leaving at least 10 cm of residue to allow for regrowth.

Given its annual growth habit, sunn hemp can provide a high degree of flexibility in forage management and augment cool-season perennial forage production during summer.


Genetic Covariance of Environments in the Potato National Chip-Processing Trial

The potato National Chip-Processing Trial (NCPT) is one of the largest public variety trials in the U.S. Approximately 100 new clones are evaluated each year, and 20 to 30% are selected for a second year of testing.

In the January–February 2019 issue of *Crop Science*, NCPT data from 2011 to 2016 were used to estimate the genetic covariance between environments, defined as location-year combinations, based on factor-analytic (FA) models. Specific gravity (which affects the frying process) was relatively consistent across locations, with an average genetic correlation of 0.7. By contrast, there was more differentiation between the locations for yield, with average genetic correlations ranging from 0.1 to 0.6.

A new method was developed to visualize the pattern of covariance in FA models, based on linear discriminant (LD) analysis of the factor loadings. This procedure rotates the loadings to minimize the variation within a location (across years) relative to the variation between locations. The environments for each location are then color-coded and enclosed within a convex hull (polygon) of the same color.

The result for yield (see figure) shows that Texas constitutes a unique set of environments for yield. The genetic correlations from this study are being used to design selection indices for potato variety development.


![Sunn hemp growth at 45 days after planting at the Bradford Research Center, Columbia, Missouri.](image)

![Linear discriminant (LD) analysis of the rescaled factor loadings from the minimum-Akaike information criterion (AIC) model. Each point represents an environment, color coded by location and enclosed by a convex hull (polygon).](image)

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