

## REDESIGNING FORAGES AND FORAGE SYSTEMS



# Redesigning Forage Germplasm and Production Systems for Efficiency, Profitability, and Sustainability of Dairy Farms

This Forage project is one of six main areas of research emphasis at the U.S. Dairy Forage Research Center

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### Objectives:

1. Overcome the production and profitability problems suffered in grazing-based systems because of poor plant persistence, inconsistent forage quality, and lack of resilience/stability.
2. Develop new alfalfa (*Medicago sativa* L.) production systems that are less costly, more productive, and of greater value for livestock and biomass conversion.
3. Develop improved understanding of the fundamental physiological, anatomical, and genetic controls that affect forage quality during plant development and digestion in the rumen.
4. Broaden the range of alternative forage cropping systems to fulfill dietary needs, reduce environmental risk, and improve management flexibility.

### Approach:

We propose to develop new and more efficient management strategies and new forage cultivars, focused on four basic research themes related to forage plants and systems: (1) grass-based management-intensive rotational grazing systems, (2) harvested alfalfa as a bioenergy feedstock or livestock feed, (3) selection criteria for improving forage quality of pastures and harvested forages, and (4) alternative establishment methods and forage cropping systems.

Hypothesis-driven research will be conducted largely with field trials designed to test new or improved cropping systems, management strategies, establishment methods, or germplasms in direct comparison to current or existing treatments. Field studies will be supplemented with laboratory analyses of forage characteristics related to nutritional value, plant cell walls, physical traits of stems and leaves, or DNA markers to identify functional relationships of field observations with expected ruminal livestock performance.

New forage cultivars and management strategies will be used to streamline forage production systems, increasing profitability and sustainability, while lessening environmental impact.

**U.S. Dairy Forage Research Center**

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