

# Integrated Pest & Crop Management



## Inter-Seeding Legumes in Pastures can Offset High Nitrogen Prices

By John A. Lory and Rob Kallenbach

High nitrogen prices have farmers scrambling for ways to reduce fertilizer costs on Missouri pastures. One possible option is inter-seeding a legume such as red clover, birdsfoot trefoil, or lespedeza. Legumes fix nitrogen from the atmosphere providing the nitrogen needed for their own growth and sharing some their nitrogen with neighboring grass plants.

Legumes transfer up to 20% of the nitrogen they fix to the surrounding grass. Legumes have the capacity to fix 50 to 300 pounds of nitrogen per acre so the potential contribution can be significant. Grass doubly benefits from the legume, it gains fixed nitrogen from nitrogen transfer and the grass benefits from reduced competition for the limited nitrogen already in the soil.

Here are some tips to succeed with inter-seeded legumes:

Phosphorus and pH are important! Legumes need a higher soil test values to succeed than do most grasses. In low fertility pastures legumes will germinate but fail to establish.

The following table provides guidance for the minimum soil test levels for stand success. Optimum phosphorus soil test is 40 to 45 pounds per acre. Raising soil test levels to the minimum should allow legumes to establish in a pasture. Raising soil test levels from the minimum to the optimum should increase forage yield and quality of both grasses and inter-seeded grasses. It is recommended to wait 6 months after liming before seeding legumes on low pH soils.

### Minimum soil test levels for success

Forage	pH	Soil test phosphorus (lbs/acre)	Soil test potassium (lbs/acre)
Alfalfa	6.5	40	300
Red Clover	6.0	25	250
White Clover	5.5	25	250
Birdsfoot Trefoil	5.5	20	225
Lespedeza	5.0	20	200

Do not apply nitrogen! Fertilizer nitrogen increases the competitive advantage of grasses hurting establishment of inter-seeded legumes. Missouri research demonstrated that as little as 25 lbs/acre spring nitrogen reduced lespedeza in a mixed sward and 100 lbs/acre essentially eliminated it. Low rates of nitrogen (up to 50 lbs/acre) may be considered in August to promote fall grass growth on established mixed stands.

Options for seeding include frost seeding and no-till drill. Optimum seed depth is 1/4 inch and it is better to be too shallow than too deep. Recommended seeding rates are 4 lbs/acre for red clover, 6 lbs/acre for birdsfoot trefoil and 10 lbs/acre for lespedeza and alfalfa. The objective is a stand that is about 30% legumes. Minimize grass competition during establishment by keeping grass short when legumes are germinating. This can be accomplished through flash grazing or clipping in early spring.

Legume-grass pastures are different from grass-only pastures fertilized with nitrogen. They will typically be slower to start vigorous growth in early spring but may hold quality and production later into the early summer. Low soil test levels, too much nitrogen in the soil, and/or too much grass competition can lead to poor results from inter-seeding legumes.

There have always been good reasons to inter-seed legumes into pastures. Legumes improve the quality of forage, particularly in endophyte-infected tall fescue pastures. Legumes can eliminate spring nitrogen applications reducing fertilizer nitrogen need up to 100 lbs/acre. High nitrogen prices make this an even more attractive management choice. The savings in nitrogen fertilizer more than cover seeding costs. Some of the savings can be used for lime, phosphorus and/or potassium on fields with low soil tests.

John Lory, [LoryJ@missouri.edu](mailto:LoryJ@missouri.edu)  
Rob Kallenbach, [KallenbachR@missouri.edu](mailto:KallenbachR@missouri.edu)



### Table of Contents

**Inter-Seeding Legumes in Pastures can Offset High Nitrogen Prices**

Page 1

**Managing High Fertilizer Prices on Pastures**

Page 2

**Safeguarding Missouri's Citizens and Agriculture Through Pesticide Applicator Training**

Page 2

**Weather Data for the Week Ending January 22, 2008**

Page 4