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PREFERRED SOIL TYPES FOR LEGUME SPECIES

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Background. Forage legumes, such as clovers, are more soil specific than grasses. Texture (sand, fine sandy loam, loam, etc.), pH, and drainage (well-drained vs poorly drained) are soil factors that dictate which legume species would do best on that particular soil. Data from variety trials, research studies, and personal experience, were used to identify the preferred soil characteristics of legume species grown in East Texas. The better adapted a legume species is to a specific soil, the more productive that legume will be and less management will be required to maintain the legume.

Current Information. Preferred soil attributes by legume species are reported in Table 1. Most species require a soil pH of 6.0 to 7.0. Hairy vetch has the ability to grow over the widest pH range of 5.0 to 8.0. Alfalfa, ball, berseem, red, and sweetclover grow best on a neutral to alkaline soil. If the soil pH is too low, it can be increased by application of limestone. Soil texture and soil drainage generally are uneconomical to alter. Berseem, Persian, and white clover can tolerate poor drainage and therefore are used primarily in creek and riverbottoms.

Where and how a legume is utilized is important in selecting the right species for a pasture system. Maturity, bloat potential, hardseededness, and cold tolerance are shown in Table 1. Hay fields should be overseeded with an early maturing species such as crimson so as not to restrict late spring growth of the summer grass. Arrowleaf and berseem are late maturing species that work well in mixtures with small grains and ryegrass because they lengthen the grazing season. Legume bloat can generally be controlled by planting ryegrass with the clover so that the available forage for grazing is an equal mixture of clover and grass. Special care should be taken when grazing high bloat potential forages such as pure stands of alfalfa or Persian clover. There is no bloat problem when legumes are harvested for hay and fed to livestock.

Hardseededness is only important if the legume is to be managed for natural reseeding. Hard seed do not germinate because they cannot absorb moisture. This is a desirable character since it prevents clover seed germination during summer rains. Hard seed do become soft with time and temperature fluctuation. The ideal legume species is one that produces a high percentage hard seed but becomes soft in autumn when temperature is favorable for establishment and growth. Arrowleaf, ball, and white clovers produce the most hard seed and are the easiest to manage for reseeding. Freeze damage in East Texas is only a problem for berseem and the *brachycalycinum* species of subterranean clover.

TABLE 1. PREFERRED SOILS AND PLANT ATTRIBUTES OF FORAGE LEGUMES GROWN IN TEXAS

	Preferred Soil Attributes			Plant Attributes			
	pH	Texture	Drainage	Maturity	Bloat potential	Hardseededness	Cold tolerance
Alfalfa	>6.5	loam	good	perennial	high	low	good
Arrowleaf (Yuchi)	6.0-7.0	sand, loam	good	late	low	high	good
Ball	>6.5	loam, clay	fair	late	low	high	good
Berseem (Bigbee)	6.5-8.0	loam, clay	poor	late	low	low	poor
Crimson	6.0-7.0	sand, loam, clay	good	early	medium	low	good
Persian	6.0-8.0	loam, clay	poor	medium	high	medium	fair
Red	6.5-8.0	loam, clay	good	late/biennial	low	low	good
Rose (Overton R18)	5.5-8.0	sand, loam, clay	good	medium	low	high	good
Subterranean subterraneum sp. (Mt. Barker, Woogenellup)	6.0-7.3	loam, clay	fair	early-late	medium	low	fair
brachycalycinum sp. (Clare, Koala)	7.0-8.0	loam, clay	fair	medium	medium	low	poor
Sweetclover (Hubam)	>6.5	loam, clay	good	late	low	low	good
Vetch (Hairy)	5.0-8.0	sand, loam, clay	fair	late	low	medium	good
White (La. S-1)	6.0-7.5	loam, clay	poor	late/perennial	medium	high	good