AGRI SCIENCE

FIELD CROPS

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Legume Seed Production

STAND ESTABLISHMENT

Soils and Fertility

Legumes are grown primarily on grey-wooded soils, which they help to improve. Dark Grey, grey black and black soils are usually reserved for cereal crops and rape because of their higher organic matter and nitrogen content.

Phosphorus (P) is deficient if the soil tests less than 20 pounds. It would be desirable to bring it up to 40 pounds by either working fertilizer in prior to seeding or banding it near the seed. Nitrogen (N) may also be necessary in low fertility soils. At least 10 pounds in the soil should be available until the legumes can manufacture their own. Potassium (K) is usually sufficient and sulfur (S) may be required in certain soils as indicated by soil test.

Acidity may be a problem. In such cases red clover does best, unless in areas with flooding, where alsike should be grown. Birdsfoot trefoil is somewhat acid-tolerant. Alfalfa is least acid tolerant. Acidity can be neutralized by applying lime, but this is expensive. Some improvement in alfalfa has been noted when small quantities of lime have been drilled in with the seed.

Seed Inoculation

Inoculated legumes fix nitrogen from the air. The inoculum consists of bacteria, Rhizobium, which enter the roots of legumes and form nodules. There the bacteria combine the nitrogen from the air in the soil with food from the plant to form protein which is used by the alfalfa or other plants.

Cultivation prior to seeding improves aeration and moisture, both very important to nitrogen fixation. Seed should be inoculated at time of planting, as the bacteria dry and die very quickly. The inoculum is usually dispersed in finely ground peat. Fertilizers should not be mixed with the seed, but rather side banded or mixed with the soil prior to seeding. Legumes should not be mixed with cereals treated with fungicides.

Nodules that are pink or red inside indicate high nitrogen fixation. If they are white, green or brown, very little nitrogen is being fixed. There are numerous strains of Rhizobium and different legumes require different strains. An inoculum containing two strains is available at most seed supply houses. This combination can serve for alfalfa, sweetclover and the clovers (red, alsike and white). Different strains, which are difficult to obtain, are required for birdsfoot trefoil, sainfoin and milk vetch. There is now on the market pre-inoculated seed for some legumes. However, it must be kept cool; heat or sunshine will make the inoculum useless.

Density of Stand

Legumes should be seeded into moist soil preferably not deeper than 1/2 inch. Good seed yields can be obtained at a density of one plant/sq. ft. for alfalfa, (1 lb/acre); two plants/sq. ft. for red clover, (2 lb/acre); and four plants/sq. ft. for alsike and sweetclover, (2 lb/acre). Four pounds/acre may be required with solid stands or in competition with companion crops.

Spacings are 24 inches for alfalfa; and 18 to 24 inches for red clover, sainfoin, alsike, and birdsfoot trefoil.

Seed rows east and west to alleviate wind damage of swaths. Do not cultivate until seedlings are established. It is preferable to mow weeds down than to cover seedlings with soil. Cultivation in July and fall will suffice the first year. In the spring, one shallow cultivation followed by harrowing will leave a smooth field and allow aeration and moisture penetration.

(continued)

Companion Crops

In wet years companion crops do not seem to have any adverse effect. In dry years they tend to set back development of legume seedlings; the stand is poorer and the legume crop is later blooming the following year and produces less seed.

Companion crops can be used with alfalfa, sweetclover, alsike and red clover, but the rates of seeding of the companion crop should be decreased and that of the legume increased. If at all possible the drill should be plugged in the rows that the legume is being planted. Birdsfoot trefoil, and sainfoin should not be seeded with a companion crop, as they cannot stand competition.

Considerably more research needs to be conducted on companion crops.

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