appeared previously. The resistant variety, Apollo, is the only resistant variety that has yielded well in Kentucky tests. Resistant varieties should be considered if Phytophthora root rot has been a problem in the particular field being used. However, no variety has juvenile resistance to this disease. Cultural practices must be applied even with resistant varieties to avoid heavy losses from this disease during the seedling period. Avoid fields that are poorly drained and be aware of temporary wet sites on otherwise well drained fields. Deep plowing this disease.

Verticillium Wilt

To date, Verticillium wilt has been found only in areas north of Kentucky, especially on a line north of Pennsylvania, Northern Iowa, and Oregon. This is primarily a cool season disease so many feel it is unlikely that it can become a problem in Kentucky. However, the disease has recently been found to be seed-borne, so we should be watchful for it because the fungus could adapt since our climate is cool enough for the disease to operate during Spring and Fall months.

The no-till concept has been widely accepted in Virginia for corn and soybean production. However, alfalfa is still commonly established by plowing and tilling the soil into a fine seedbed. Each year many tons of productive topsoil is eroded by rainfall on these prepared seedbeds. The resulting gullies remain in the hayfield for the life of the stand to damage equipment and "rattle the teeth" of the operator.

Other advantages of establishing alfalfa without tillage quickly come to mind. Moisture in the seedbed is conserved for use by the new seedlings instead of being lost to the atmosphere after tillage. Time is saved during seeding because of the reduced number of trips across the field. Fuel conservation also results from fewer trips that require less power.

Research at Virginia Tech, as well as at other universities, has established several "musts" for establishing no-till alfalfa:

1. Living competition must be eliminated.
2. Plant debris tall enough to shade the soil surface must be removed.
3. Protection must be provided against a wide spectrum of insects.
4. Seed must be placed in the soil and no deeper than one inch.
5. Soil fertility and pH must be adequate.

Elimination of plant competition is dependent primarily upon herbicides. The general "recipe" being followed in Virginia is:

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Apply 2,4-D if broadleaf plants are present. After 10-14 days apply Paraquat. After another 10-14 days apply Paraquat again. Seed 15 lb of alfalfa seed plus 15 lb of 10G granular Furadan per acre.

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There are many variations of this general guideline, depending on the particular situation. For example, 2,4-D may not be needed if broadleaf weeds are not present. It may also be applied earlier than indicated, such as in fall prior to spring seedling or in the spring prior to summer seeding. The rate of Paraquat may vary from 1 to 4 pts. per application, depending on...
type and amount of vegetation. In some instances, such as in small grain stubble, only one application may be necessary. If hard-to-kill plants such as quackgrass are present, Roundup may be substituted for the 2,4-D and Paraquat applications.

Spring applications of Paraquat on sod must be delayed until the plants to be killed back are actively growing. If applied while the plants are still semi-dormant, the Paraquat only burns the leaf tips back. Sprayer pressure should be 40-50 PSI and 40-50 gallons of Paraquat - water - surfactant should be delivered per acre.

Furadan is a necessary part of the management package in order to protect the relatively puny alfalfa seedling from insects. The exact insects or complex of them involved is not known. There also is reportedly a growth stimulatory effect of this insecticide. The granular form of Furadan must be incorporated into the soil with the seed in order to meet label requirements. Granular Furadan can be effectively mixed with the seed in the seedbox without settling out as the seeder bounces across the field. If the seeder being used has an agitator in the seedbox, separation of the Furadan is likely to occur.

There are many different situations in forage systems where no-till alfalfa can fit. In most cases, seeding as part of a normal crop rotation will aid in assuring adequate soil fertility and pH for alfalfa. We are concerned that some producers immediately want to seed alfalfa in a thin pasture sod whose soil fertility and pH are much too low to produce high yielding alfalfa.

No-till seedings into a perennial pasture or hay sod can be done effectively in either fall or spring using some variation of a no-till seeder. Of particular concern in any soil is the lack of residual weed control. No residual herbicide is available to control weeds that germinate and compete with the new alfalfa seedlings. Fall seeding offers the advantage of less weed competition but insect pressure and soil moisture stress may be greater.

Spring seedings in perennial sods cannot be made as early as with conventional tillage because the plants in the sod must be actively growing for the contact herbicide to be effective. This further favors weed competition. However, we have been able to establish excellent alfalfa stands from spring seedings. Usually, even though weed competition may be severe, timely mowing enables the alfalfa seedlings to become established and eventually dominate the weeds present.

An alternative to seeding into sod in spring is to graze or harvest hay. Then spray with Paraquat and sod-seed a summer annual such as sorghum-sudangrass, millet or perhaps grain.
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No-till seeding into a perennial pasture or hay sod can be done effectively in either fall or spring using some variation of the reciprocating no-till drills. Of particular concern is the lack of residual weed control. No residual herbicide is available to control weeds that germinate and compete with the new alfalfa seedlings. Fall seeding offers the advantage of less weed competition but insect pressure and soil moisture stress may be greater.

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