

Combining Forage Species in a Seeding Mixture

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When deciding what seeding rate to use for establishing a new forage seeding, you need to consider the percentage seed germination, seedling vigor, and the size of the mature plant. The pure seed and seed germination percentage are listed on the bag's tag for certified and inspected seed. Vigor of the seedlings that germinate depends on the species and age of seed. Larger seeded plants usually have more vigorous seedlings than small-seeded plants. Seed are more vigorous the year after harvest than they are if they have aged too long. The size of the mature plant depends on the genetic ability of the species to increase in size and by the amount of open space around the plant. Some forage species can increase in size by tillering (Kentucky bluegrass, orchardgrass, tall fescue, timothy) or by growing larger crowns (alfalfa, red clover, birdsfoot trefoil, lespedeza). Other species are able to use open areas of the stand by moving growing points underground (Kentucky bluegrass, tall fescue, smooth brome grass, reed canarygrass) or above ground (common and ladino-type white clover, bermudagrass).

Increasing the seeding rate to compensate for poor seedbed preparation is usually not justified. If seeds fall on an area of ground that is not suitable for germination and survival, two seeds will do no better than one. If two seedlings emerge close to each other, they will compete with each other and may do no better than one seed.

In general, seeding rates of individual species are lower when combined in a mix than when seeding alone but the total seeding rate of the mix may be higher. When mixing forage species, use those that are compatible in growth habit and complement each other in growth distribution and ecological niche.

Growth habit determines the forage specie's response to grazing or machine harvest management. Orchardgrass, tall fescue, bluegrass, and reedtop are similar in growth habit. These species head in the spring then tiller in later growths keeping the growing point near the ground. They can tolerate close, frequent defoliation. Orchardgrass is less tolerant of repeated frequent, close defoliation than the others. Timothy, smooth brome grass, and reed canarygrass are different. These forages go to joint (the growing point grows up above the soil surface) in every growth cycle and can be injured if grazed or hayed at the wrong time.

Alfalfa, red clover, and upright birdsfoot trefoil (Viking type) are good legumes to use in hay mixtures with orchardgrass, tall fescue, timothy, brome grass, or reed canarygrass. Ladino and

common white clover, red clover, alsike clover, and prostrate-type birdsfoot trefoil (Empire type) are good legumes to use with orchardgrass, tall fescue, bluegrass, and redtop where grazing is the primary harvest method.

Growth distribution in forage species is a response to weather and day length. Some forages grow better in cool weather; others grow better in warm weather. Tall fescue is more tolerant of hot and dry weather than orchardgrass; timothy is the least tolerant. The flush of spring growth in grasses is related to day length and differs among species. Orchardgrass heads out under shorter day lengths than does timothy. Redtop is one of the latest of cool season grasses to go to head. There are differences between varieties within a species. Hallmark orchardgrass goes to head sooner than Pennlate and has more vigorous fall growth.

Ecological niches of forage species differ and are related to climate, soil fertility, soil drainage, harvest management, and pest pressure. The plants growing in an established pasture are usually the ones best adapted to the current combination of site and management. If you want a different plant cover you will have to change the management, soil fertility or soil drainage. Some species will not grow well on some soils. An example is alfalfa does not do well on wet or on shallow soils. In these cases you need to change the legume species to clover or birdsfoot trefoil or find to an appropriate soil (field) to grow the alfalfa.

When soils are variable in drainage it is often beneficial to mix two species that complement each other relative to drainage. Birdsfoot trefoil and ladino clover mix well with alfalfa on fields with variable drainage. The trefoil or ladino clover will predominate in poorly drained areas of the field and the alfalfa will thrive in the well-drained areas of the field. Likewise when seeding Kentucky bluegrass use varieties tolerant to different leaf diseases to improve the quality of forage over the year. One advantage of planting ladino clover in an alfalfa stand is to ensure the presence of a desirable forage species which will fill in open areas where weeds would otherwise invade.

General comments on establishing forages and making seeding mixtures:

1. Soil test and apply adequate lime and fertilizer for the forage species being planted.
2. Use certified seed to ensure that you have the variety and the quality seed you want.
3. Prepare the seed bed adequately for the seeding method being used.
4. Be prepared to manage the established forage properly since the plants that grow in your fields are the ones best suited to the management applied to those fields.
- 5 The best grasses for general use in West Virginia are tall fescue, orchardgrass, Kentucky bluegrass, timothy, smooth brome grass, and reed canarygrass.
6. The best legumes for general use in West Virginia are red clover, ladino clover, alfalfa, alsike clover, and birdsfoot trefoil.
7. If you want to grow alfalfa make sure you have a deep well drained soil (at least 24 inches to bed rock or seasonal water table) with a soil pH above 6.5
8. Seeding only one forage species will result in other plants invading more quickly. These may be "weeds" or native forages. Multispecies forage mixes will reduce weed encroachment as long as the stand is managed properly (fertilizer, lime, and harvest management).

9. Livestock will avoid grazing toxic endophyte-infected tall fescue if other species are present. Because of this use endophyte-free or tall fescue containing enhanced/friendly endophyte. Tall fescue with toxic endophyte can be grown in mixes with Kentucky bluegrass and white clover which will take close grazing. Adding crabgrass to toxic tall fescue stands provides a high quality warm-season grass that grows well during the heat of summer to dilute out the toxic effect of the tall fescue at the time of year that the toxin hurts the livestock the most.
10. A little ladino clover (1 lb./acre) is good in an alfalfa mix since it will often fill in as the alfalfa thins and reduce weed invasion. Where smooth brome grass grows well, it will do the same. A small amount of Kentucky bluegrass serves the same purpose in an orchardgrass or endophyte-free tall fescue stand.
11. Alsike clover is well adapted to cool, moist areas of the state. It tolerates wet, acid soils and is inexpensive. However, there are no certified varieties of the forage. When grown with timothy under good conditions, alsike clover can be hard to mow for hay but should be avoided when feeding horses.
12. Redtop is a palatable grass that establishes very rapidly and is good for reducing erosion on steeper slopes. It is tolerant to wet and acid soils. Redtop should not be grown for hay unless in mixture with timothy. It lodges easily and is difficult to mow.

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