



## Planting Native Grasses and Forbs for Wildlife

Establishing native grasses and wildflowers (forbs) isn't always an easy process, but attention to detail will lead to a successful project. Refer to the information in this guide to help you through the establishment process. The diagrams at the end of this document provide a visual guideline for the establishment process.

Considerations:

The most common reasons for failed native plantings are **1) inadequate competition control, 2) poor seed-to-soil contact, and 3) planting too deep.**

Most of the native warm season perennial species we deal with have extensive root systems, many with a depth of 8 feet or more. During the year of establishment, these plants are growing more below ground than above—if plant competition is allowed to grow above the native seedlings and shade or smother them out in their first year, the natives will die. Scouting for weeds the growing season(s) prior to preparing a site for natives is a *crucial* first step. Once you know what you're up against, you can take the necessary approach to reduce competition. It is best to address weed/competition issues prior to planting—it is often difficult to deal with problematic weeds AFTER the seeds have been planted, especially in a grass/forb mixture! If it takes a year (or more) of spraying or tilling to knock out problematic weeds, it is well worth the investment to do so. Native seeds aren't cheap!

When plantings have failed due to competition in the past, the culprit has usually been an annual grass like foxtail, crabgrass, or barnyard grass. If annual grasses such as these are prominent, it's best to deal with them prior to planting by either delaying planting and allowing a summer spray, or to use a pre-emergent herbicide like imazapic to provide control during establishment (only certain native species are tolerant of imazapic and at specific rates!). If the project area has a history of being cropped or grazed, anticipate a flush of warm season annual weeds after the crop or sod is gone and plan accordingly.

If you spend a year or more controlling competition prior to planting natives, it is important to keep the ground covered to prevent soil erosion as well as encroachment by other weeds. Projects where fields were left bare over winter after multiple herbicide treatments were usually infested with thistle, teasel, knapweed, or other weeds that blew in from elsewhere. Establishing cover crops (or even commodity crops in some cases) helps prevent erosion, prevent weed encroachment, and can provide wildlife food/cover during the site preparation phase.

Even if you have the best weed control, the native seeds won't germinate if there isn't sufficient contact with soil. If using tillage to prepare a site for planting, roll or cultipack the site before AND after sowing seed to ensure good seed-to-soil contact. If using a no-till drill to plant native seeds, make sure the thatch (if present) isn't too thick. A dense thatch can cause native seeds to become "pinned" in the plant material and not reach the soil. A prescribed burn may be necessary to remove dense thatch prior to drilling.

Most native species we deal with are to be planted no greater than ¼" (one-quarter inch) deep. Rolling/cultipacking prior to planting helps ensure seed won't be "swallowed" by loose soil. If drilling seed, great care should be taken when setting the machine to ensure proper planting depth.

Step-by-step:

- 1) Control the competition! Prepare the site by either thoroughly discing sites that were cropped in the previous year, OR by killing the tall fescue, orchardgrass, or other non-native grass on sites that were in pasture or hay production. Get rid of invasive species, if present.
  - a. To kill tall fescue, orchardgrass, or other cool season grasses, spray the site with an appropriate herbicide, OR use a moldboard plow to turn it under. Best results are achieved by spraying vigorously growing grass with 2 quarts of the herbicide glyphosate (Roundup, Big N Tuff, Gly-4, and others) per acre with surfactant in the fall after the first killing freeze (27 degrees or colder for 3 consecutive hours or more—usually occurs in October). Spray within 10 days of the first frost. To ensure that the grass is growing vigorously, mow, graze or harvest hay from the grass stand 10-14 days before spraying. Spraying into tall, thick, matted grass stands will not be successful. Spray the site again in the spring (early to mid-April) as necessary with 2 quarts of glyphosate herbicide per acre when there are several inches of new growth on cool season grasses that may have been missed—this will also kill any other cool season weeds that may have emerged from the seedbank. A spot spray may be all that is needed at this time—use a 2% solution of glyphosate in backpack sprayers.

Cool season grasses may also be killed by spraying with an herbicide in the spring. To ensure that the grass is growing vigorously and does not have a heavy canopy, mow, graze or harvest hay from the grass stand in the fall. Timing of the spray is more important in spring than in fall. Ideal time to spray fescue with glyphosate in the spring is when the fescue has reached the "boot" stage of growth (just prior to emergence of seedheads). Make a second application 6 weeks after the first application and then plant. Prior to planting, a prescribed burn may be necessary to remove the accumulated thatch from allowing the fescue to reach boot stage.

A one-time application of a mixture of glyphosate and the pre-emergent herbicide imazapic in the spring is effective at killing cool season grasses and providing residual control of those grasses and other weeds for up to 2-3 months. Imazapic is found in the products "Plateau," "Panoramic," and in a pre-mixed product called "Journey." Many native warm season plants are tolerant to imazapic applied at rates up to 4-12 oz/ac, depending on species (follow all herbicide labels!). Imazapic is rather expensive, and be sure to use imazapic-tolerant plant species in your seed mixture if you choose to use it.

- b. If problematic warm season weeds are prominent, take the time to control them prior to planting natives! If this delays the planting a year or more, so be it—your patience will pay off. Fields with a history of being cropped or grazed are notorious for having

warm season weeds explode once the crop or sod is gone! If delaying planting, use cover crops to keep the ground covered as necessary. See the following table for examples of cover/smother crops:

Seeding rates for cover/smother crops, alone or as a mix:

Crop	Lbs/acre alone		Lbs/acre in a mix	
	Drilled	Broadcast	Drilled	Broadcast
Buckwheat	40	60	10	15
Peredovic Sunflower	17	25	8	13
Winter wheat	120	160	N/A	N/A
Barley	100	140	N/A	N/A

- 2) After the competition has been adequately controlled, prepare the site for seeding. If tilling, prepare a firm seed bed by cultipacking or rolling prior to planting. If using a no-till drill, the drill can plant through some thatch; however, if the thatch is too thick, you may need to conduct a prescribed burn to remove it OR disc the residue to incorporate it into the soil. If the residue is disced, use care to not create erosion problems when discing. Avoid discing on riparian or hilly sites. Discing can stir up the seed bank and increase competition with your native seedlings, so some weed control may be necessary between the first time you disc and when you plant. Consider using a burning contractor if you have never burned before. A list of burning contractors can be provided upon request or on the website of the Virginia Department of Game and Inland Fisheries at [www.dgif.virginia.gov/quail](http://www.dgif.virginia.gov/quail).
- 3) After the proper weed control regime and the site is adequately prepared, sow a seed mixture as recommended or approved by your Private Lands Wildlife Biologist.

The mixture may be sown onto a firm seedbed either with a no-till drill, standard drill or a broadcast seeder (drop-type seeders are MUCH better than cyclone or spinner-type seeders!). If you disc, the seedbeds should be packed before and after seeding with a cultipacker, roller, track of a tracked vehicle, or tires of a rubber-tired vehicle. The packing will ensure placement of the seed at the proper depth and good seed-to-soil contact and germination.

**SEEDING DATES.** Sow seed between the date that is 6 weeks before the local date of last frost and the date that is 6 weeks after the local date of the last frost (it's recommended to plant no later than June 15<sup>th</sup>). The dates of the last frost are: April 1 in the Coastal Plain, April 15 in the Southern Piedmont, and May 1 in the Mountains and the Northern Piedmont. Seeding before the date of last frost will result in better germination; seeding after the date of last frost will provide opportunities for late weed control, but native seedlings are more likely to be killed by drought the closer to summer you plant.

**SEEDING DEPTHS.** Drill seed at a ¼-inch depth—NO DEEPER! When drilling seed with a no-till drill, seed will often be visible on top of the ground and this is perfectly fine. Rolling or cultipacking the soil prior to broadcasting seed ensures no loose soil will “swallow” seeds too deeply.

**CHAFFY SEEDS.** Seeds of big bluestem, indiangrass, little bluestem, wildrye, and others are 'chaffy'; that is, they have hairs or awns that prevent them from flowing through standard drills and broadcast seed spreaders. The seed must be sown with a seed drill equipped with a seed box designed to sow chaffy seeds (like a specialized NWSG drill) OR the seed must be mixed with a 'carrier'. Carriers are materials such as sand, sawdust, rice hulls, pelletized lime, and fertilizer with no nitrogen or a low nitrogen content. The rate of application of the carrier must be adjusted according to the type of seed and the seeding equipment being used. Lime and fertilizer drop-type spreaders may not be able to distribute less than 100 pounds of material per acre. The amount of carrier must be sufficient to facilitate the movement of the chaffy seed through the seeder (for pelletized lime, a 20:1 ratio of lime to seed by weight is good for even the fluffiest of mixtures). Extra care must be taken to calibrate the amount of seed dispersed when using a carrier.

**SMALL SEEDS.** Some seeds are much smaller than others and will separate in a seed mixture. The use of a carrier will distribute those seeds throughout a seed mixture and facilitate an even distribution of all seeds. Putting the small seeds in a clover box on a conventional drill can also be effective.

**SEEDING RATES.** You should buy and sow your seed on a pure live seed (PLS) basis. Most seed companies test their seeds for purity (amount that's actually seed and not chaff, debris, etc.) and germination rate. Pure live seed, as the name suggests, refers to the amount of "stuff" in a mix that is actual seed that should germinate. To convert PLS to bulk weight, divide PLS weight needed by the purity by germination rate. For example:

You need 3 lbs PLS, the purity is 75%, and the germination rate is 80%, so

$$3 \text{ lbs PLS} / (.75 * .80) = 5 \text{ lbs bulk}$$

In this case, you would need 5 lbs bulk seed material to get 3 lbs PLS. If the prescribed seeding rate was 3 lbs PLS per acre, you would need to buy and sow 5 lbs bulk seed material per acre.

No two species have the same size seed. Rather than suggesting general seeding rates by weight, we specify seeding rate by the number of seeds per acre and then calculate the weight from that. For wildlife mixes, this typically ends up being in the 4-6 pounds of pure live seed (PLS) per acre. For most seeders or drills, it's difficult to calibrate for such a low seeding rate. To help with calibration, you can include a carrier and/or a nurse crop like spring oats or buckwheat. While a nurse crop helps with calibration, it can also help a new native stand establish (if not planted too thick). Spring oats at 32 lbs/ac or buckwheat at 20 lbs/ac work well. Be sure to calibrate the seeder accordingly! For instance, if you decide to include spring oats at 32 lbs/acre along with a native seed mix that should be planted at 5 lbs/acre, calibrate to deliver 37 lbs of total material per acre.

If using a spinner/cyclone type broadcast seeder, it's a good idea to split the seed mix in half, sow one half of the seed in one direction, then sow the other half perpendicular to that. This helps ensure even coverage of the seed (especially those of different sizes) and helps prevent

you from running out of seed before the job is done (i.e. if the seeding rate is too heavy for the first half of seed, you can adjust accordingly without running out of seed).

- 4) During the summer of the first growing season, clip undesirable weeds above your planted seedlings with a mower or bush hog (no lower than 8 inches) to decrease competition. Two or 3 clippings may be necessary. Be sure to not clip the native seedlings!!!
- 5) Manage the project areas to maintain them in an early successional stage (grasses, forbs, and shrubs) by disturbing (discing, burning, or mowing) every 2-5 years. If project size is adequate, it is best to disturb about 1/3 of the area every year on rotation to leave standing cover at all times and increase diversity on the landscape. Do not disturb the sites during nesting season (April 15 until August 15). If there are weeds and trees that are not controlled by burning or mowing, remove them by spot mowing, cutting, or spraying.

Controlled grazing of native grass and forb stands by cattle during the growing season is another great way to manage them for wildlife. As a rule of thumb, try to maintain a grass canopy between 12 and 28 inches in height—this can be done by controlling the length of time the site is grazed, by the number of animals grazing the field, or a combination of the two. *Note: some government programs may not allow grazing of native species during the growing season! Check with the local conservation agency that provided assistance prior to any disturbance activity!*

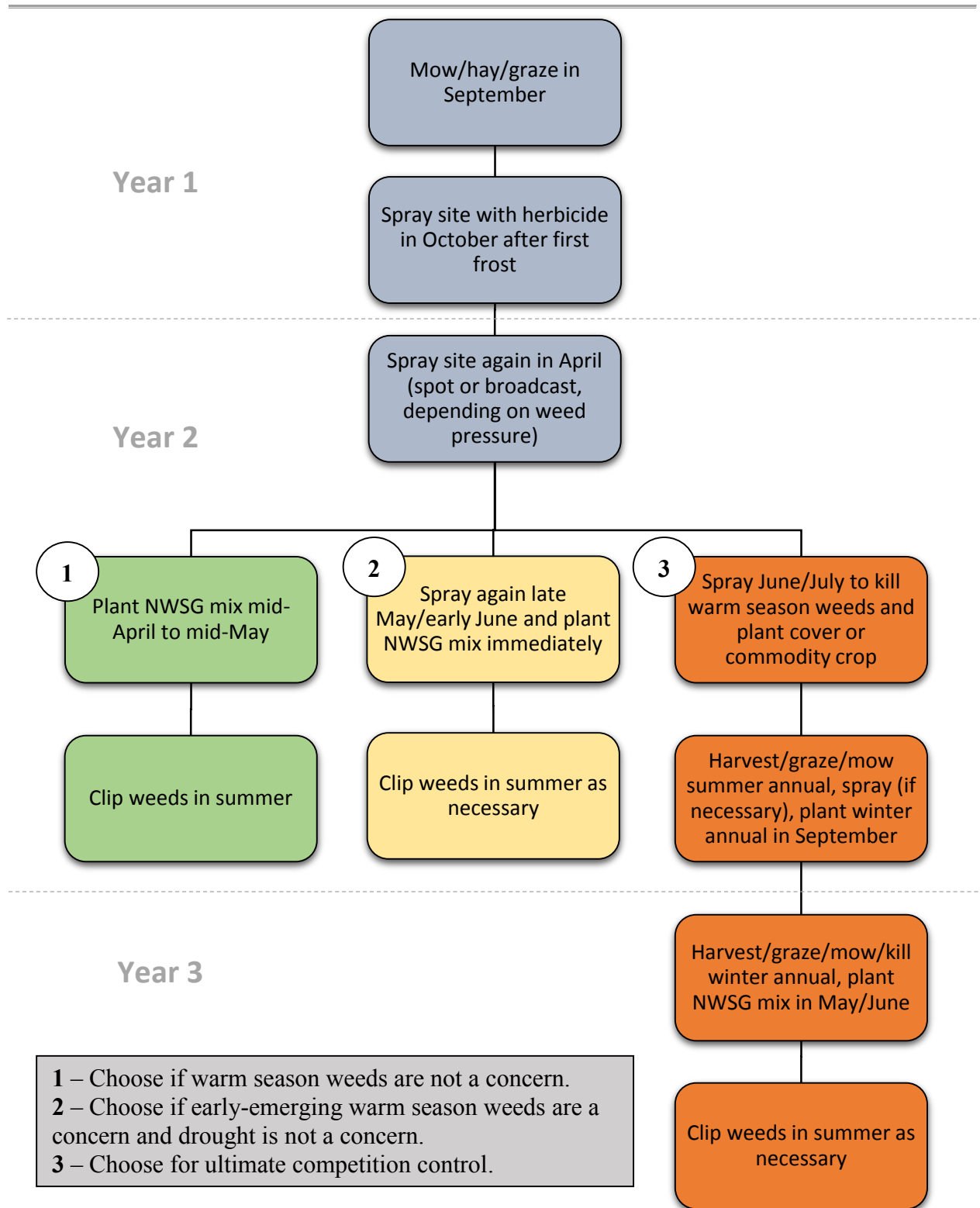
If you have any questions or concerns at any point along the way, don't hesitate to contact your local Private Lands Biologist!



[www.vaQuail.com](http://www.vaQuail.com)

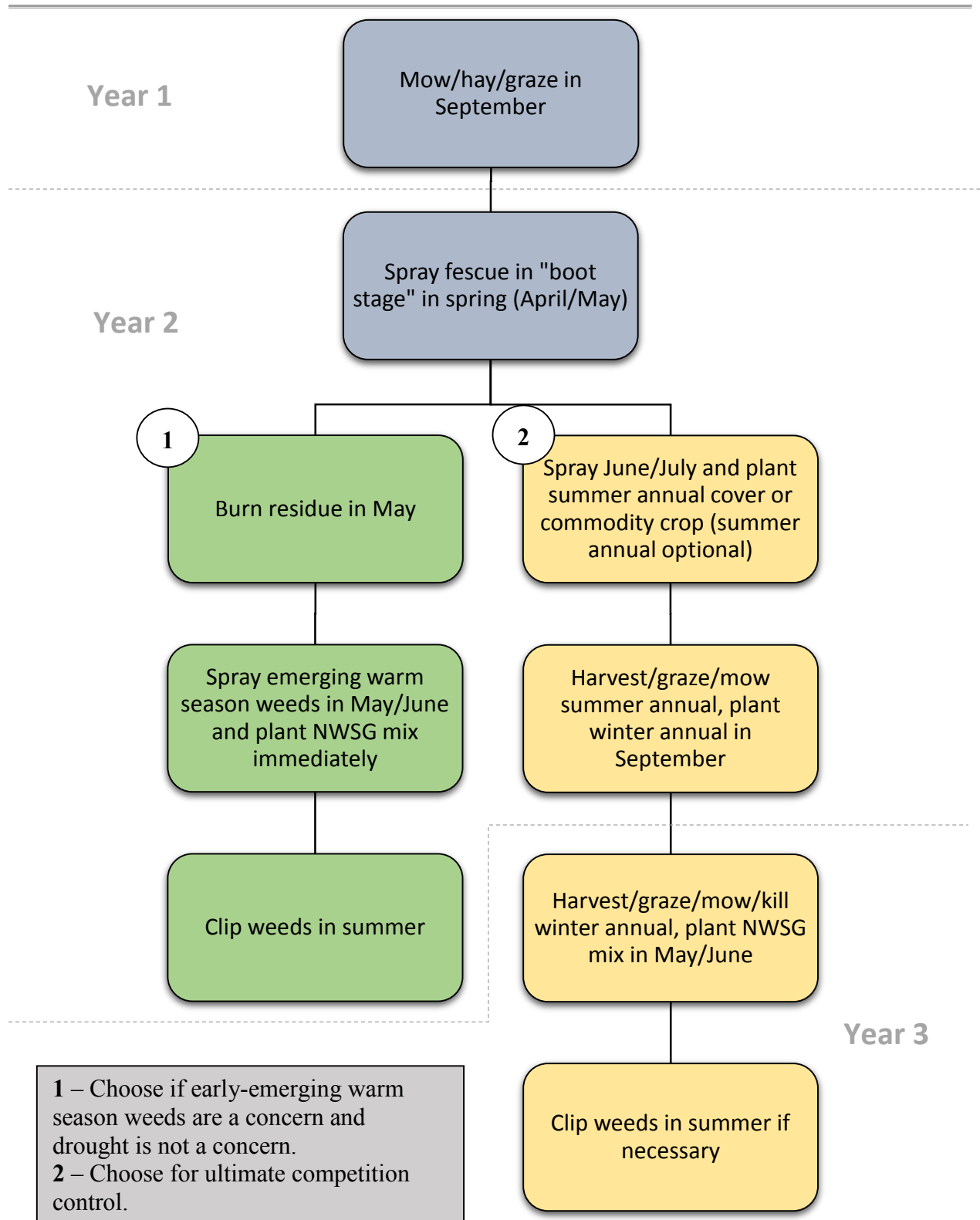
# NWSG-Forb Establishment Options

Using Herbicides, Initiating in Autumn



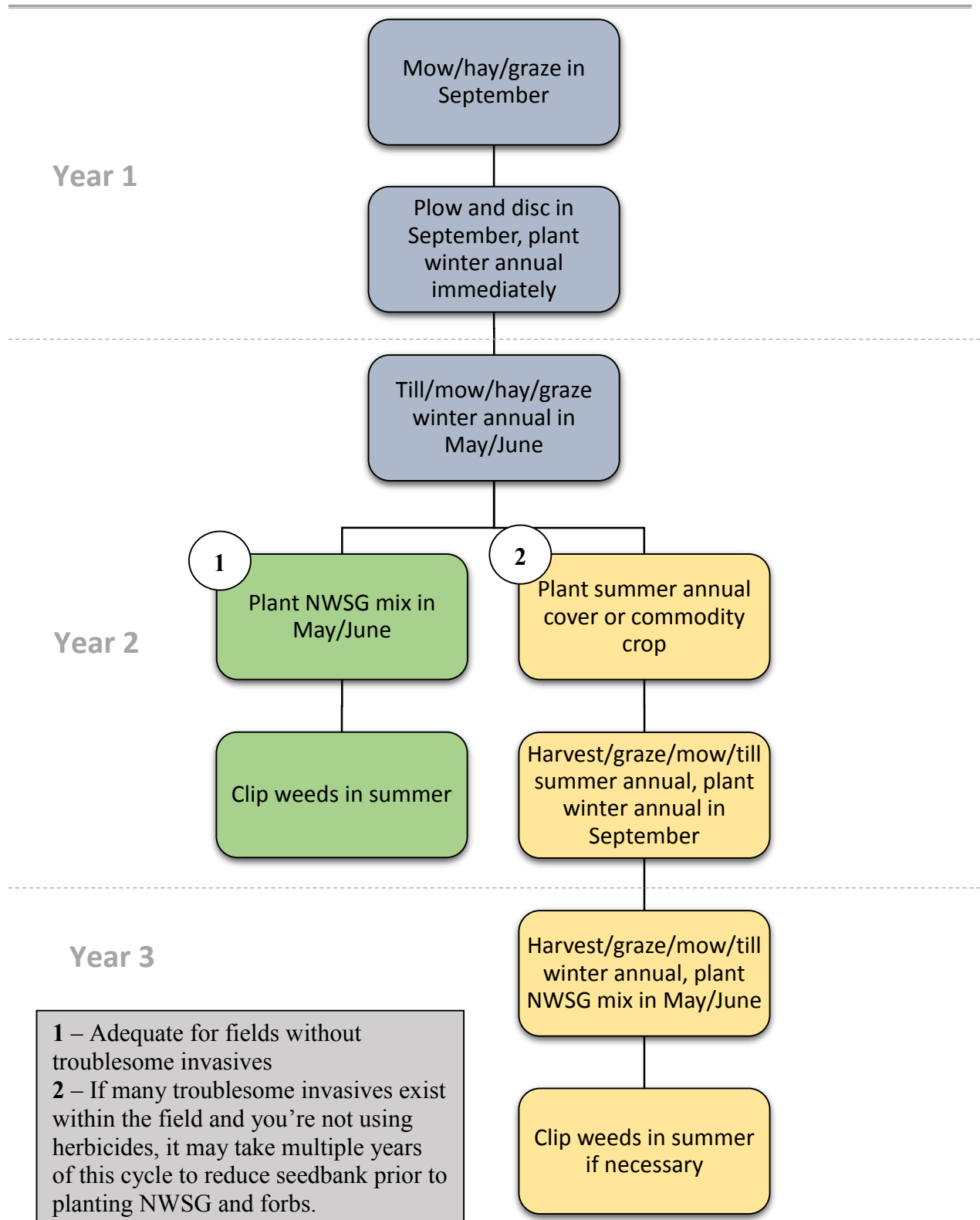
# NWSG-Forb Establishment Options

Using Herbicides, Initiating in Spring



# NWSG-Forb Establishment Options

Using Tillage (No Herbicides), Initiating in Autumn





# NWSG-Forb Establishment Options

Using Tillage (No Herbicides), Initiating in Spring

