ESTABLISHING FORAGES IN FOOD PLOTS: REDUCING THE RISK OF FOOD PLOT LOSS

by *W. Carroll Johnson, III, PhD.* – *Agronomist and Weed Scientist*

These basic guidelines will significantly lessen the chances of experiencing stand establishment problems.

A grain drill is the ideal implement to seed cereal grain forages such as Oats Plus. Using the correct implement and seeding technique is an important step in successfully establishing of food plots.

In a rare demonstration of efficiency, I wrote the first draft of this article during March 2020, which coincided with the beginning of the pandemic. The terms COVID-19, social distancing and sheltering in place became part of our everyday lexicon. When I started writing this article, the COVID-19 pandemic was a chaotic nightmare, and none of us knew what to expect. Every aspect of our society was affected. From the beginning, messages from the medical profession consistently reminded us to use three basic (foundational) preventative measures to reduce risk of infection: social distancing, fastidious hand washing and wearing face coverings. These foundational practices did not guarantee immunity but reduced risk of infection. Disruptive and annoying as they were, those basic steps were instrumental in lessening incidence of COVID-19 and saved lives.

The COVID-19 pandemic taught us countless lessons. One of the understated lessons is that a solution to a complex problem often begins with something basic or foundational. This is the case with poor forage stands in food plots. Poor stands are common in food plots, and my interest in this topic is the 100 percent correlation between poor forage stands and severe weed infestations. Accordingly, we need to discuss the basic processes of forage seeding development to help explain steps to lessen the risk of poor forage stands.

FORAGE SEED GERMINATION

Quality forage seed is the obvious starting point to establish food plots. Whitetail Institute seed products are produced from crops grown the previous season by experienced seed producers (seed production is their niche in the agriculture business), inspected for weed seed contamination and tested for germination when bagged for sale. That information is on the tag attached to each bag of seed and affirms that quality seeds are being planted.

When seed are planted, there are three basic requirements for germination: adequate oxygen to start metabolic processes inside the seed, water for the same reasons and temperature regimes to break dormancy, which are genetically unique for each crop species. Some forage species have broad requirements for germination, but some are very specific. Care went into developing each multispecies product to combine forage crops that have compatible seed germination requirements and are not haphazardly thrown together. What does that mean? A poorly composed forage blend of incompatible species with differing germination requirements will often result in one or two species dominating the site while other species in the blend struggle.

A well-prepared seedbed helps ensure optimized soil-seed contact, which is needed for forage establishment success, particularly with small-seed forages such as those found in multispecies products such as Destination.

FORAGE SEEDLING EMERGENCE

After germination, the next step is for the seedlings to journey from where the seeds were initially placed to the soil surface. Forage seedlings are tiny and fragile as they emerge from the soil, making them vulnerable to many environmental hazards. For example, in my region in southern Georgia, sandy soils are the norm and quickly become droughty. The worst planting condition in sandy soils occurs when soil moisture is barely adequate for seed germination and then it quits raining. The tiny forage seedlings, freshly emerged, have a poorly developed root system that loses access to the quickly vanishing soil moisture. As the soil surface dries, the seedling dies. This can happen with any soil, but sandy soils are particularly prone to this condition.

A common food plot production hazard is to unintentionally seed the forages too deep. During most conditions, small-seeded forages such as clover and alfalfa are best seeded from 0.25 to 0.5 inch deep, although those measurements can be a bit misleading because of variations among soil types. For example, forages planted on fine-textured soils (loams and clays) need to be seeded on the shallow end of that range. The opposite is true in sandy soils, with forage seeds placed on the deeper end of the range. This is nearly academic, because it's very difficult to measure differences in the depth of seed placement between 0.25 and 0.5 inch. When you add the effects of a fluffy, freshly tilled dry soil, it's easy to see the difficulties in controlling the depth of seed placement. Focus on the big picture: Do not bury small forage seeds. Keeping it simple, the closer to the soil surface the better for small-seed forages, provided there is adequate contact between the forage seed and the soil. The term agronomists use is adequate soil-seed contact.

There are other hazards related to seeding too deep. Assuming that oxygen, moisture and soil temperatures trigger the seed to germinate, deeply placed forage seed might consume all stored carbohydrates in the seed and have no reserves to sustain the seedling immediately after emergence. Research has shown that seedlings from deeply placed clover or alfalfa seeds are less vigorous compared to properly planted forages, and the weakened plants might not survive.

Have you watched a road being constructed? The general process involves sequential harrowing interspersed with applications of water to pack the soil. While not intentional, repeatedly harrowing a food plot when the soil is wet will mimic road construction techniques and create a packed and crusted seedbed, particularly if the weather is hot and sunny afterward. The crusty and compacted soil surface becomes a physical barrier to seedling emergence. This is especially true if you have heavy clay soils with low organic matter. Avoiding this problem comes with experience in managing your food plot soil, which is difficult to verbalize. The best explanation I can offer is to remember this construction analogy and avoid tillage when the soil is wet. Otherwise, you make a roadbed out of a food plot. This makes it almost impossible for young, tender seedlings to penetrate the soil surface.

POST-EMERGENCE FORAGE SURVIVAL

Assuming the forage seeds have germinated and the tiny seedlings emerged, the next hurdle is for the young seedlings to survive long enough to become photosynthetically active and generally tolerant of normal environmental fluctuations. At this point, the young forage plants are no longer dependent on carbohydrates stored in the seed and are relying on photosynthesis for their food production. Additionally, the young root system is now developed enough to provide soil moisture to sustain plant growth.

If the food plot soil is acidic (low pH) or nutritionally deficient, these issues become evident after forage seedlings emerge. Nitrogen fixation is the process by nitrogen-fixing *Rhizobium* bacteria in the soil to colonize legume forage roots and convert atmospheric nitrogen to forms usable by the plant. If soils are acidic, the bacteria cannot function, and the plant becomes nitrogen deficient. Acidic soils also create deficiencies by altering the chemical form of other essential plant nutrients, making them unavailable to plants (Table 1). Finally, acidic soils create aluminum toxicity that affects forage growth after seedling emergence.

Table 1. Effects of soil pH on fertilizer use efficiency.

RELATIVE NUTRIENT AVAILABILITY (%)

Soil pH	Nitrogen	Phosphorous	Potassium	Average fertilizer wasted %
4.5	30	30	33	71.3
5.0	53	53	52	53.7
5.5	77	77	77	32.7
6.0	89	89	100	19.7
7.0	100	100	100	0

Environmental conditions also directly affect survival of young forage plants. These factors are obvious: drought, flooding, freezing temperatures and excessive heat. There are also secondary effects that might be equally devastating. For example, short-term drought after seedling emergence might not kill young forages but would stunt early season growth and allow weeds to infest the food plot. After all, weeds are opportunists, and slowed forage growth because of environmental stresses (in this example, drought) gives weedy invaders an opportunity. That secondary effect is a common contributing factor to hopeless weed infestations in food plots.

BE PROACTIVE

Linking successful food plot establishment with COVID-19 is a bit of a stretch, but managing both involves a proactive approach built around the basics. This is a punch-list of crucial food plot tasks reduce to the risk of stand establishment failure:

- Take a soil sample, and fertilize/lime according to recommendations.
- Choose a quality forage product that's suitable for your location and land-use pattern.
- Avoid planting during extremes (too dry, wet, hot or cold).
- Avoid seeding too deep.

These basic guidelines do not guarantee food plot success but significantly lessen the risk of stand establishment problems. Similarly, social distancing, hand washing, face coverings and newly developed vaccines (early in 2021) did not guarantee immunity from COVID-19, but those practices collectively lessened risk of infection.

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