

HOW DO CLOVERS ADD NITROGEN TO PASTURES?

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One of the most important practices that any forage producer can incorporate into their program is adding legumes to grass pastures and hayfields. Even though there are several benefits to planting clovers, the main one most people think of is the nitrogen that is added by the legume. There have been many research projects over the years showing that a tall fescue/clover mixture can produce the same yield as tall fescue fertilized with 60 pounds of nitrogen per acre. A lot of times we make the statement “Clovers make nitrogen.” But technically that is not correct. So how do legumes decrease nitrogen fertilizer needs?

The first thing to recognize is there is a huge amount of nitrogen in the atmosphere. The air you breathe is actually mostly nitrogen – 78 percent nitrogen to be more specific. Legumes form a symbiotic relationship with a type of bacteria in the *Rhizobium* genus. These bacteria form nodules on the roots. The bacteria in these nodules take nitrogen from the atmosphere and put it into a form that the legume can use to make protein and grow. This process is known as nitrogen fixation.

How does the nitrogen get over into the grass? The legume is able to use this nitrogen to grow, but the grass surrounding the clover plant does not have access to that nitrogen. The grass can get that nitrogen through an indirect process. As the legume grows, producing new leaves and roots, there is the constant death and replacement of roots, root hairs, and leaves. As these plant parts break down in the soil, the nitrogen in these parts is released into the soil, then becoming available to the grass for uptake and use in growth. The nitrogen transfer is due to legume plants dying and the nitrogen being recycled.

Why is this important? I can think of a couple of reasons. First, it makes an excellent topic of conversation at any New Year’s parties. Everybody appreciates a good forage fact. But a second reason understanding this is important is because it helps in some management decisions. For instance, often we hesitate to use herbicides because we don’t want to kill our clovers. But if we recognize that the death of clover plant parts is what provides the nitrogen the grass needs, then we can incorporate herbicides spray into our program without hurting the nitrogen transfer.

How is this possible? Think about spraying in December or early January to kill weeds. It may kill some or all of your clovers, depending on the herbicide and the rate used. Killing these clovers will result in nitrogen being available to the grass in the spring. If we have used 2,4-D, we can come back in 3-4 weeks and replant clovers, resulting in very little damage to the future nitrogen transfer cycle in our pasture or hayfield.

Clover planting recommendations - The last two weeks of February is your clover planting target window. You should plant two lb white clover and four lb red clover per acre. Mix these seed and broadcast across a pasture or hayfield that has less than a 3-inch stubble. Freezing and thawing that will occur over the next month will help soil to seed contact.

What if you sprayed a herbicide? If you sprayed 2,4-D to kill weeds, you need to make sure to

wait 3-4 weeks before planting clovers. If you sprayed Grazon Next or Chaparral any time after June of last year, you will have to wait until fall or next winter to plant clovers. One of the chemicals in these herbicides has some residual activity and will prevent new clover seedlings from developing.

Clovers are a key component of any good forage program. Be sure to utilize their ability to capture an atmospheric resource and put it into the soil.