

R. L. & Pat Dalrymple
DALRYMPLE FARMS
dba "Elstel Farm and Seeds"
"The Crabgrass Seed Folks "

Warehouse: 24160 East 950 Road
Weatherford, OK 73096
No Phone

Farm/Office: 24275 East 910 Road
Thomas, OK 73669
Phone/Fax :580-661-3997

E-Mail:rlandpat@cableone.net•Web:redrivercrabgrass.com•R.L's Cell Ph:[580-670-0043](tel:580-670-0043)(**Best No.**)

**Fact Sheet 2002 : Tillage or Renovation for 'Quick-N-Big®' and
'Red River' Crabgrass Benefits**

Introduction: The "Quick-N-Big® " and 'Red River' crabgrass varieties of crabgrass are used for grazing and hay forage, soil conservation, and other uses in a very wide range of circumstances. There are many needed management inputs, just like any other crop, for the **stand and production** to be successful and **upper level**. These inputs include: proper planting or volunteer management, adequate fertilization and/or legume input, good grazing and haying practices, weed control by grazing, haying, mowing, or herbicides, good mixture and double cropping procedures, soil tillage/renovation, and other things. This fact sheet deals with the tillage/renovation aspect for volunteer management at a good level. While this information is primarily **relevant to managing for volunteer stands and production**, the basics apply to new plantings, too.

Research and Demonstration Results: We have seen numerous times in our fields, and other producer fields, the benefits to off-season (fall to spring) tillage for crabgrass forage. We are in favor of minimized tillage to limit input expenses, but we know adequate tillage can greatly help these forages. When I researched and used crabgrass while at the Noble Foundation, we recorded many tillage responses. Some of them are summarized as follows. Noble foundation is given credit for this work.

A major negative response to crabgrass stand and total production was from tillage **done after crabgrass germination started, stands emerged, or stands were producing**. There are some exceptions, but generally, for crabgrass's sake, **do not till after germination starts**.

Usual field responses were that crabgrass production following proper tillage was better than short-term no-tillage by 15% to over 50%. **Disked areas produced up to 260% of non-disked areas**. In one case, an area disked in early spring produced **6480 lbs/acre compared to 3120 lbs/acre** in the **non-disked area**. But, both treatment were disked in the fall. Both areas received 55 lbs /acre actual nitrogen during summer **plus residual** from the winter crop. An area tilled just after seedling emergence had near zero production because it did not re-establish due to delayed rains.

Average total production in lbs/acre from a two-year trial from volunteer stands illustrated that in **some years no-tillage failed to produce June or July forage**, whereas **disk tilled areas**

regularly produced June and later forage at a much higher level overall. At the 60 lbs/acre nitrogen rate, **fall and spring disking produced 3550 lbs/acre while no-tillage produced 2900 lbs/acre.** The tilled area made 22% more grass in total. In these trials, **tilled areas produced up to 260% of no-tilled areas.** No-till areas never produced more than tilled areas. The soil was a medium quality fine sandy loam soil.

In general, the more thorough **the surface tillage** before germination and the better the soil is re-firmed, the better the stand (planted or volunteer) and early production. The deeper the tillage, and the looser the final renovation, the later the forage is available, but the greater the total production if stands develop well. Even moldboard plowing and re-firming showed good results in total, but **early season yields were non-existent.** The same is true with deep disking or chiseling. These tests show the importance of the input, but we know there are successful no-tillage stands, too.

Tillage versus No-Tillage: Tillage operations are best, but the crabgrasses are used successfully in tillage and no-tillage syndromes. The absence of tillage, does not always dictate failure of crabgrass, but **tillage helps greatly to increase production.** No-till cases tend to be primarily where the grass is used in mixtures with bermudagrass, bahiagrass, Old World bluestems, fescue, orchardgrass, bromegrass, and other perennials. During warm seasons of good moisture and other acceptable management, the crabgrass can function very well and be useful forage in these mixtures. Even in these cases, light and thorough soil surface tillage in the off season produces a better stand and good production. Livestock treading, and the more the better, in these cases is a help and a form of surface tillage.

There are cases when a grazier chooses to minimize equipment input in a winter pasture-crabgrass double crop, and tillage is skipped for a season or more. Volunteer crabgrass may produce in these cases, but it is later and at lower production levels than where adequate tillage is done. **If this type of double crop is no-till year after year, the crabgrass usually lessens each year and is very erratic, other vegetation invades, and ultimately there is little crabgrass pasture left.**

The 2001 dry summer season in Oklahoma produced many examples of the great differences possible. There were many cases where lightly tilled (disked or sweep plowed) and re-firmed soil at winter pasture end produced excellent crabgrass pasture and no-tilled areas had very poor to zero pasture. Adequate tillage is good when it can be done where the soil, terrain, and equipment are acceptable.

Timing of Tillage: Essentially, all tillage **for crabgrass** should be done during **the off-season.** In Oklahoma, this is generally sometime during September to early April. Tillage *for* crabgrass should usually **never be done after crabgrass seedlings emerge.** To do so causes the stand to be damaged and it may have to re-emerge following more rain. That rain may be too late that year.

In pure crabgrass areas where double cropping or mixtures are not a part of the forage program, tillage is best done just before active germination. This date is usually just before, at, or shortly after the date of the last spring killing freeze or as deciduous trees bud.

In cases where crabgrass is grown in perennial grass mixtures, the helpful soil surface tillage can be done **anytime during fall to spring when the perennial forage residue is short.** The closer

to spring that the tillage is done, generally the better. Sometimes, this type of tillage is done on a paddock by paddock basis, as these areas are properly grazed or hayed and available for the treatment. Tillage in these areas will need to be light to moderate so perennial stands persist. **Generally 30% to 50% of the soil surface should be renovated , either scratched heavy with a drag tooth harrow, or lightly tilled on the surface with a straight set light disc.**

In the cases where crabgrass is used as a double crop with winter annual forages, the **fall tillage** usually done for winter pasture, hay or grain **helps the crabgrass the next summer**. But, spring tillage alone or additional **tillage at winter's end is even more helpful**.

In the case of cereal (grain) rye, and crabgrass double crop, the rye quits early enough in spring to do the spring tillage for crabgrass without destroying an early crabgrass stand. Fall and spring tillage is possible with rye. **Take the rye out extra early**. An alternative is to no-till rye in early fall in short crabgrass stubble **and be sure to do the tillage in the spring**. That has worked well with good fertilization.

When crabgrass is double cropped with wheat, oats, barley, triticale, annual ryegrass, annual brome grass, and many winter legumes, the volunteer crabgrass stand is often present in late April to May or early June before the winter forage use is complete. My view **is not to destroy a crabgrass stand**, even under no-till in spring, but to **fertilize and manage it**. So, in this case, the fall tillage at planting is usually the best.

In these cases, in the areas of the southeast United States where early summer rains are more likely, some producers go ahead and do the spring tillage late and go for a more productive second stand. I do not like to do that in Oklahoma, as there is a great risk of not getting rain until Too late or until fall , and not getting a second stand in time.

Moisture is Important: Adequate soil moisture, from good rainfall or irrigation, amounts and distribution helps to make either tillage or no-tillage production better. Good moisture can make a no-tillage case successful, but that same situation under tillage is greatly better. **Without good moisture no-tillage is more likely to be poor**. Rain or irrigation is always needed after spring tillage for crabgrass germination, stand development, and production.

Tillage Tools: Tools to till soil for crabgrass are wide and varied and regionally different . Listed as follows, in order of light to more intense tillage, are common tools used for this purpose: drag spiketooth harrow, chain or flex harrow, aerator, mulch-treader, sweep plow, field cultivator, chisel plow with sweep points, shallow chisel plow with chisel points, tandem disk, offset disk, and moldboard plow. There are others such as the combination disk-cultivator-roller type tools like the “Do-All” brand and others. Many of these tools can be run shallow to deep. We primarily use a disk, but also the field cultivator and chisel plows and mulch-treader. Regardless of the tool used, **the final seedbed should be dragged, rolled, or packed to smooth and refirm** the soil for good seed to soil contact. Re-firming may not make sense, but results show it is best.

As this is being updated in 2013 , it is important to mention that the relatively new “Vertical Tillage “ tools should work well for this renovation and keep the land in place better at the same time.

A **heavily pugged (trampled)** winter pasture or permanent grass such as bermudagrass and fescue will be “tilled” by that treatment. Volunteer crabgrass will invariably be better there than a non-pugged area without some tillage.

Ranges of Intensity of Tillage: The most important thing is to **till relatively shallow and as thorough at that depth as possible**. For example, using a disk, field cultivator, chisel with sweeps, or a sweep plow **at two to four inches deep is excellent** if the seed bank in the upper soil profile is good. But, there will be some positive effect from only scuffing the soil surface up to working at only two inches deep. This shallow tillage is more useful in perennial grass stands.

Extremely deep tillage from a sharp point chisel plow, offset disk, or moldboard plow often buries seed too deep for early and good volunteer stands. These tillages are sometimes needed, but are not usually recommended.

When managing **new stands**, where there is little seed bank in the upper soil profile, it is very important to till **very shallow at two to three inches the first few seasons** after the original planting to assure placing of some seed for volunteer close to the top of the soil for good stands. A field cultivator, chisel plow, and disk all work well for this type tillage. **Always** drag, roll, or pack to refirm and smooth the area. Rain completes the work.

Bermudagrass or Bahiagrass and Crabgrass mixtures are somewhat common throughout the south eastern US from Oklahoma to Florida. We have seen many of them and some on our own farm. These mixtures are just happenstance, or they are on purpose. These mixtures are good mixtures. Especially if the crabgrass component is these more upright growing improved varieties, rather than the extreme prostrate types that sometimes occur. These natural prostrate types can actually crowd out the perennial bermudagrass or bahiagrass to some degree.

Several years ago, we produced excellent Midland Bermudagrass and Red River crabgrass mixture pasture (on purpose) to good success. We overseeded the RRCG into the decades old bermudagrass stand. During that time we did some research on the benefit of **surface light tillage** or renovation of the crabgrass and bermudagrass component. We tilled the surface of the pasture in October with a mulch treader, a tool common to the southern plains. The tool is somewhat like an unpowered rototiller on a disc frame, and it was set to work only to about 1 inch to 2 inches deep, and to disturb about 50 % of the paddock surface.

The response was good. The pasture was fertilized with 40 pounds actual nitrogen per acre in May. The good yields shown later indicate there was some carry over nitrogen to produce this grass volume. **Total yields of the non-tilled treatment was 2789 lbs / acre for the full summer. Total yield for the renovated area was 5060 LBS per acre for the summer, or 80% more than the non-renovated treatment.** The difference in the yield was, no doubt, primarily from the increase in RRCG in the renovated treatment. At the end of summer, **the non-renovated area contained about 7 % RRCG stand and the renovated area contained about 68%.** These figures attest to the vast importance of light tillage, or surface renovation, in grass mixtures to maintain and increase the high quality crabgrass component.

Also visit our web site www.redrivercrabgrass.com, and the Noble Foundation web site : www.noble.org. On the Noble site, click on : “Agriculture Programs”, “Publications”, “Agriculture Publications”, search for titles with the word “crabgrass” and click on for more information about crabgrass forage.