

FOCUS on South Plains Agriculture

Texas AgriLife Research and Extension Center at Lubbock
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Cotton Insects

Wireworms and birds reducing stands

I have been getting reports of wireworms reducing stand in Dawson and Gaines counties. Manda Anderson, IPM Agent in Gaines County, has provided information regarding what she has been seeing, [click here](#) to view her newsletter. Some growers and consultants are finding wireworm larvae actively feeding. Most damage is inflicted by overwintering larvae as they become active in the spring, although adult *Blapstinus* spp have been known to girdle or clip seedling cotton off at the soil surface much like a cutworm. The larvae damage cotton by feeding on the root, hypocotyl and cotyledons of plants prior to emergence from the soil. Root feeding can kill plants, but usually results in stunting. The most severe damage occurs when the hypocotyl is severed resulting in plant death and stand reduction. Larvae will also feed on the growing point of the plant causing a loss of apical dominance; these plants often take on a "Christmas tree" appearance after emergence. The telltale sign of wireworm feeding is to look at the surviving emerged seedling for the presence of "shot" holes in the cotyledons. If you are not finding "shot" holes associated with wireworm grubs, then it is likely something else is reducing the stand.

Additionally in Gaines County, Manda Anderson, IPM Agent, and Ben Neudorf, Consultant, and others have noticed what initially was thought to be poor stands due to wireworms or cutworms. But after they inspected the fields they found the cotyledon lying to the side of the stem with no "shot" holes and no cutworms present. Further investigation, revealed that birds were snipping the hypocotyl in two during emergence. Several field suffered significant bird damage, but as more cotton in

the area emerged the birds seem to disperse and not concentrate on individual fields so much. Be careful not to mistake bird damage for wireworm damage.



Wireworm grub



Cotyledons with shot holes from wireworms

If you are facing replanting due to wireworms, you should consider using a seed treatment containing imidacloprid (Gaucho 600, Aeris, and generics such as Macho 600), thiamethoxam (Cruiser, Avicta Complete) or clothiadan (Poncho/Votivo), or an in-furrow insecticide such as Thimet. Temik is not thought to be highly effective on wireworms.



Birds have been observed clipping emerging seedling cotton in Gaines County (arrow pointing to severed hypocotyl)

Thrips

With the dry conditions delaying much of the planting, it's hard to say much about how intense the thrips pressure will be this year. However, conventional wisdom would suggest that in areas where there isn't much green grass or small grains available for thrips to disperse out of, that their number should be suppressed. Thus far where we have been scouting for thrips they have been reaching treatable populations around Lamesa and Muleshoe. Populations in the Halfway area so far have been low while those in Lamesa have resulted in severe damage to the emerging first true leaf.

We have also conducted some thrips identification from specimens collected from Halfway, Muleshoe and Lamesa. Last week, Halfway was running about 80% onion thrips and 20% western flower thrips, Muleshoe was running about 80% western flower thrips and 20% onion thrips, while in Lamesa we were finding 100% onion thrips. Generally speaking,

onion thrips should be more easily controlled with seed treatments and foliar sprays than the western flower thrips. However that being said, under dry conditions seed treatments and in-furrow insecticides will usually not provide as effective control of thrips as when the soil has good consistent moisture.

Seed treatments of Aeris, Cruiser, or Avicta CC should provide 14-21 days of protection post emergence, whereas Temik at 3.5 lbs or more will typically provide 24-30 days of protection, depending on the species of thrips and soil moisture. However, if a preventive treatment was not used, fields need to be watched closely; especially during the first few weeks following emergence, which is a critical period. Don't hesitate to treat during this early window; waiting on weeds to emerge so you can apply your insecticide with glyphosate could be disastrous. You have to treat before damage occurs.

All cotton, regardless of prior treatment, needs to be monitored at least weekly for thrips control determination. Thrips prefer to feed on the underside of the leaves and primarily on the newer growth. Thrips, particularly the immature stages, are somewhat cryptic and like to hide in curled leaves. Thus when scouting for thrips, it is important to tease open curled or folded leaves using a knife or pencil to find the thrips hiding within. If there was a soil applied insecticide or seed treatment used for thrips control, the presence of immature thrips will indicate that colonization is occurring and that the insecticide is playing out. When this occurs, a foliar insecticide application may be justified.

Spider mites

We have been picking up a few spider mites but not enough to be concerned with. It is not uncommon to see a few mites on seedling cotton during dry years such as this, but these will usually disappear within a few weeks.

Leaf miners

We are seeing some pretty high levels of cotyledon mining by vegetable leaf miners in the

Lamesa area. Mining may stunt growth, but to date we have no evidence that they will cause any yield loss. Seedlings were averaging about 2 mines per plant. Seed treatments that appear to control early leaf miners in our tests include: Avicta Complete and Poncho/Votivo. Gaucho 600 does not appear to be effective and we are not certain about Aeris or Cruiser. DLK

Cotton Agronomy

Overview of 2011 Season Thus Far

Planting of the 2011 cotton crop is underway, but progress is slow due to extreme drought conditions that continue across the Texas High Plains. [Total rainfall for January 1 through May 19](#) is well below the long term average for Lubbock. Moderately high temperatures and low humidity, coupled with unrelenting winds, are creating planting challenges even in irrigated fields. Most of the planting that has taken place has been in fields under center pivot or furrow irrigated production systems where as high as 3-4" of pre-plant irrigation has been applied. Many producers with subsurface drip irrigated acres are finding it difficult, if not impossible, to get sufficient moisture into the seed zone for successful planting. Especially those producers that don't have the capability of applying surface moisture either through furrow irrigation or remaining sprinkler systems. The latest reports from Texas AgriLife Extension Ag Agents indicate that approximately 25-30% of the cotton acreage has been planted thus far. Of those that have been fortunate enough to plant into adequate moisture, some are experiencing slow emergence which may be attributed to reduced soil temperatures resulting from continued applications of cool irrigation water. One bright spot however, is that [heat unit accumulations for May 1 to May 18](#) are approximately 4% above the long term average for Lubbock. Dryland production acres in most areas have yet to be planted. I submit that this will continue to be the case until sufficient rainfall occurs or until we reach the final planting dates for those areas ([click here to access final planting dates for Texas High Plains](#)). As the final planting dates

draw near, those that have not already dry-planted will most likely choose to do so for insurance purposes. In addition to insurance, many seed companies are offering replant and drought relief programs to producers in 2011 ([click here to access Plains Cotton Growers Website for more information](#)).

Tank Cleanout Concerns

This time of year, we generally begin to get phone calls and make field inspections concerning hormone-type herbicide damage on cotton. Typical phenoxy herbicide symptomology includes “strapping of leaves”. Based on field research conducted by Dr. Wayne Keeling, the severity of yield decrease is related to the actual dose and the crop stage. Severe damage incurred when the crop begins to fruit is more likely to reduce yield than when the crop is younger with less severe damage. Doses sufficient to continue “strapping” of newer leaves for weeks after application will probably have a significant negative impact on yield. Producers should be aware, especially in light of the “tank and hose cleaning ability” of some of the newer herbicides, that phenoxy residue in sprayers can be a real problem. ***The suggestion for our growers is that tanks, hoses, and sprayers which are used for applying phenoxy type herbicides be dedicated SOLELY to that purpose.*** If producers are unable to purchase separate tanks, hoses and/or sprayers, then it is imperative that several issues be addressed. Do not leave herbicides in tanks for an extended period of time. It is best to use “chemical resistant” hoses. The last thing a cotton field needs is for a phenoxy material (even at low concentrations) to get “pulled from the tank or hoses” and get sprayed on cotton – especially those fields with high yield potential (i.e. subsurface drip or high capacity pivots). If multiple herbicides are used in the sprayer, then it is suggest that producers purchase various tank cleaning agents from their dealers and follow the directions, including cleaner concentration, religiously. If a tank/sprayer is to be used on cotton, then the tank should be flushed out with clean water and the appropriate tank cleaner be mixed at the appropriate

concentration. The producer should then spray the cleaning solution through the booms and nozzles. Leave the booms in a horizontal position and let the cleaning solution sit in the tank at least overnight. ***Replace hoses when changing out tanks or using a large sprayer which has been spraying any other products besides those labeled for cotton.*** This might help reduce some anxiety over phenoxy damage later. It doesn’t take very many lost bales of production to pay for an additional tank and hoses or smaller sprayer.

Here is a [great University of Missouri publication on cleaning sprayers](#). This publication has good information concerning herbicides, recommended cleaning solutions and sensitive crops. MSK/RKB

Early Season Weed Control

The use of preemergence herbicides at planting is dictated by several factors. Larger-seeded annual broadleaf weeds and perennial weeds are generally poorly controlled by preplant incorporated herbicides such as Treflan and Prowl. The need for soil-applied herbicides is an effective strategy for resistance management and is critical in non-transgenic cotton where postemergence herbicide options are limited. Areas with intense weed pressure will benefit from soil applied herbicides regardless of the use of transgenic varieties. It is well-documented that early-season weed control is critical for uniform crop stands and to eliminate early season weed competition for limited resources such as water and nutrients. The use of a preemergence herbicide will provide a good start to weed management, especially in the event that a timely postemergence application cannot be made.

Herbicides applied preemergence are generally applied prior to emergence of both the weed and the crop, although crop tolerance may allow some preemergence herbicides to be applied after crop emergence. The length of soil activity varies by herbicide, herbicide rate, rainfall/irrigation, soil texture, soil organic matter, and pH. Since these factors vary for each herbicide, it is very important to carefully

follow label instructions and make sure that your soil type allows for the use of the pre-emergence herbicide in question. All pre-emergence herbicides applied to the soil need rainfall or irrigation for activation. There is potential, however, for crop injury when soil-applied herbicides are used on sandy textured soils.

Options for herbicides that may be applied preemergence in cotton as well as options for early-postemergence are given below along with some general comments. For complete information, please read the herbicide label.

Caparol at planting provides good control of several small-seeded broadleaf weeds and annual morningglory. Do not use on sand or loamy sand soils. **Cotoran** provides good broad-spectrum control of several annual broadleaf and some grass weeds including annual nightshade, Venice mallow, and spurred anoda and has activity on common cocklebur and morningglory. In west Texas, do not use on sand, loamy sand, or fine sandy loam soils. **Diuron (Direx, Karmex)** applied at planting controls many annual broadleaf weeds and some grass weeds. Do not use on sand. **Dual Magnum (Dual II Magnum, Cinch, Metolachlor)** controls annual grasses and small-seeded broadleaf weeds and has good activity on yellow nutsedge. Do not use on sand and loamy sand soils. Do not use in Gaines County. **Prowl (Pendimethalin products)** in addition to pre-plant incorporated applications may be applied at planting or up to 2 days after planting. The addition of Prowl at planting will improve annual grass and small-seeded broadleaf weed control. **Staple** applied preemergence has good activity on many small-seeded broadleaf weeds such as pigweed and annual morningglories. Preemergence combinations of Staple plus Caparol or Direx broaden the spectrum of residual activity compared to these herbicides applied alone. These are especially effective combinations for use in non-transgenic cotton where postemergence options are limited. Since product labels change from year to year, always carefully read and follow label recommendations for a variety of information, including herbicide rate, adjuvant use, interval

restrictions between application and planting, or other application restrictions.

Herbicides applied early postemergence (EPOST) are essential when weeds are not controlled by preplant and preemergence herbicides. Herbicides applied EPOST are generally applied to both emerged crops and weeds; therefore, it is necessary to have some mechanism of selectivity between crops and weeds. Early season weed control is essential in order to avoid competition for water and nutrients between crops and weeds. Severe early season competition can cause crop stand, which may lead to yield loss. Early emerging weeds will have a much larger impact on yield than weeds that emerge later in the growing season.

In general, EPOST herbicides are most effective when applied to small, actively growing weeds. Control will generally be reduced when herbicides are applied to stressed weeds that exceed the size recommendation on the label. Weeds could be suffering from stress if exposed to extended periods of hot and dry or cool and wet climatic conditions. The period of time needed from application to rainfall or irrigation varies for each herbicide. In general, a six-hour rain free period is sufficient for most herbicides, although some formulations have decreased this time to approximately one hour. Many postemergence (POST) herbicides require a spray additive to ensure maximum herbicide performance. In west Texas, a crop oil concentrate is recommended over non-ionic surfactants for many herbicides, while for other herbicides, the choice is not as critical as long as a good quality spray additive is used. Some herbicide labels suggest the addition of liquid nitrogen fertilizers or dry spray grade ammonium sulfate for improving herbicide performance. Mixing order and compatibility are an issue for many herbicides; therefore, always carefully read and follow label instructions for maximum herbicide performance.

There are two types of herbicides applied POST: systemic (mobile) and contact (non-mobile). Systemic POST herbicides are absorbed by leaves and translocate to sites within the plant where the herbicide is needed to control the weed. Contact herbicides kill only the plant tissue that comes in direct con-

tact with the herbicide. Thorough coverage on leaf and stem surfaces is more critical for contact herbicides compared to systemic herbicides. Thorough coverage can be accomplished by applying herbicides to smaller weeds, increasing the carrier volume and/or spray pressure, proper boom height, and accurately applying the herbicide to weeds growing beneath the crop canopy (through various nozzle arrangements and spray equipment).

The length of soil activity (residual activity) of POST herbicides varies from no soil activity to activity season-long or even into the next growing season. It is important to know the rotational crop restrictions when choosing a POST herbicide since some of these herbicides may influence rotational crop selection. It is also important to know if a herbicide has limited or no residual activity so additional weed control practices are planned for season-long control.

The use of some POST herbicides is dependent on the variety selection. Below are herbicide options in Roundup Ready Flex, GlyTol, LibertyLink, GlyTol plus Liberty Link, and conventional cotton varieties.

ROUNDUP READY FLEX COTTON: **Roundup WeatherMax[®], Roundup OriginalMax[®], (and several other glyphosate formulations)** may be applied OVER-THE-TOP (OTT) in Roundup Ready Flex cotton from GROUND CRACK to 60% OPEN BOLL. Two full rates of 22 oz/A may be made alone or in tank mixture. Sequential OTT applications must be at least 10 days apart and cotton must have at least two new nodes of growth between applications. Glyphosate provides excellent control of many annual broadleaf and grassy weeds and controls or suppresses several perennial weeds including silverleaf nightshade (whiteweed) and woollyleaf bursage (lake-weed). Applications should start when weeds are fairly small (1 to 3 inches tall) to avoid weed competition. Larger weeds may be controlled, but weed competition early season could reduce cotton yield. Not all glyphosate formulations contain a non-ionic surfactant, so depending on the formulation used, additional adjuvants may be needed. A few generic formulations have been reported to cause leaf burn

in the past, so use an approved glyphosate formulation that you trust. Spray grade ammonium sulfate may also be used as a spray additive and is generally recommended with glyphosate applications in west Texas. Ammonium sulfate helps condition the hard water typically found in west Texas. If ammonium sulfate is used, make sure it is added to the tank prior to the addition of glyphosate. Potential tank mix partners with glyphosate OTT include **Staple, Dual Magnum, Prowl H2O, Assure II, Envoke, Fusilade, Parrlay, Poast Plus, Select Max, and Warrant**. Consult the glyphosate label to ensure other tank mixes are labeled for use with glyphosate in Roundup Ready Flex cotton.

GLYTOL COTTON: This is a new glyphosate-resistant trait developed by Bayer CropScience. This trait gives cotton season-long plant tolerance to glyphosate using a different gene and promoter than the Roundup Ready Flex technology by Monsanto. Any brand of glyphosate herbicide registered for use on cotton may be used OTT of GlyTol cotton unless expressly prohibited on the herbicide label. Recent research using the following herbicides has shown excellent crop safety: Glyfos X-Tra[®], Glyfos X-Tra Flex[®], Touchdown Total[®], Buccaneer[®], Roundup PowerMax[®], Makaze[®], Credit Extra[®]. Glyphosate rates and application timings in GlyTol cotton is similar to strategies used in Roundup Ready Flex cotton.

LIBERTYLINK COTTON: **Ignite 280** at 22 to 43 ounces per acre may be applied OTT of LibertyLink cotton from emergence to 70 days before harvest. For best results, apply to emerged, young and actively growing weeds. High humidity, warm temperatures, and bright sunlight will help maximize herbicide performance. Three applications, 22-29 ounces per acre, for a season maximum use of 87 oz/A is the most common way to use this herbicide. If environmental conditions delay the first application where 30-43 oz/A are needed, a second application may be made using 22-29 oz/A for a season maximum use of 72 oz. All sequential applications should be at least 10-14 days apart. Carrier volumes should be a minimum of 15 gallons per acre. Ignite controls many

broadleaf weeds, including annual morning-glory and cocklebur.

CONVENTIONAL COTTON: Staple may be applied POST on conventional and herbicide-tolerant varieties. It is one of the few herbicides that may be applied over-the-top (OTT) for broadleaf weed control in non-transgenic cotton. Staple has good activity on Palmer amaranth and annual morningglories, but **WEED SIZE** (2 inches or less) is important for effective weed control. Annual and perennial grasses may be controlled with the POST-Grass herbicides which include: **Assure II, Fusilade, Fusion, Poast Plus, and Select**. Control of bermudagrass will require sequential applications of these products. Tank-mixes of the POST-Grass herbicides and Staple should be avoided since antagonism can occur. *MSMA/DSMA is labeled for use postemergence-directed in cotton after a height differential has been established between cotton and weeds. MSMA may be used OTT (3 inches to early first square) at a reduced rate as a rescue operation, but expect cotton injury to occur.* **Envoke** is a relatively new cotton herbicide that will be available in 2011 west of I-35. The spectrum of weed control with Envoke is similar to that of Staple.

GLYTOL PLUS LIBERTYLINK COTTON: This cotton has full tolerance to both Roundup (glyphosate) and Ignite 280 (glufosinate). This technology will help control difficult-to-control weeds and assist in resistant management. Since this technology is new in 2011, there is no commercial experience to suggest how this technology should be used. Previous research suggests that antagonism on Palmer amaranth (carelessweed) control may occur if Roundup and Ignite 280 are applied in tank mixture; therefore, tank mixing these two products IS NOT recommended. A sequential application of Ignite 280 early postemergence followed by Roundup mid-postemergence has been shown to be effective on several weed species including Palmer amaranth and ivyleaf morningglory.

Always carefully read and follow herbicide label instructions! PD/WK

Cotton Disease Update

Things are relatively quiet on the cotton disease front. There have been a few reports of seedling disease; however, the number one issue affecting emergence now is poor moisture conditions. Irrigation wells are being (and have been) pushed pretty hard to provide adequate planting moisture. The dry, windy conditions we have been experiencing over the past few weeks are not helping the situation either. We have extremely bad emergence in plots that had been row watered prior to planting and received additional irrigation 5-7 days after planting. In addition, the cool spell that we experienced a few weeks ago in addition to the cooling of the soil temperature due to the application of irrigation water further compounds stand establishment. Several things were noticed under these conditions. First seeds appear to have imbibed moisture, but died before the radical could develop and tap into moisture that was available below the seed furrow. [Here are some pictures.](#) Many plants exhibited "big shank" which may have resulted in seed sinking in the soil following a light shower that occurred 5 days after planting. While seedling disease pathogens, such as *Rhizoctonia solani* and *Pythium* spp., have the potential to reduce cotton stands via pre-emergence or post-emergence damping off, the warmer conditions expected over the next week to 10 days are less favorable for seedling disease development. Again the major limitation to getting a cotton stand will be moisture availability. If you have any questions regarding cotton disease, contact Jason Woodward at the Lubbock Center, 806-746-4053. JW

Corn Insects

New Bt corn registrations

EPA has approved a 5% refuge-in-the-bag (RIB) for corn sold either as Genuity SmartStax RIB Complete (Monsanto/Genuity) or REFUGE ADVANCED Powered by SmartStax (Dow AgroSciences). These are pyramid toxin corn hybrids that contain technology developed by each company and are shared through a licensing agreement. There is very little seed for

these hybrids this year and the only legal way to get RIB is to buy seed specifically tagged for RIB. It is not legal to mix seed on your own. There should be a better supply of Genuity SmartStax RIB Complete and REFUGE ADVANCED Powered by SmartStax for next year's crop. The other important point is that REFUGE IN A BAG IS ONLY LEGAL NORTH OF AMARILLO. Areas south of Amarillo still have block refuge requirements, and these block refuges south of Amarillo must be at least 20 percent. Obviously, neither of these RIB products will be sold south of Amarillo.

The second development is that Agrisure Viptera 3220 (Syngenta) has been registered. This corn has three toxins targeted at caterpillar pests; Cry1Ab, Cry1F and Vip3a. At present, Agrisure Viptera 3220 has a 5% structured refuge (only) north of Amarillo. Syngenta has requested a RIB from EPA but the decision is still pending. RPP

Sorghum Agronomy

Grain Sorghum Pocket Production Guides—Yours for the Asking

Under the auspices of United Sorghum Checkoff Program, Texas AgriLife Extension has prepared several comprehensive pocket production guides that are available to producers. You may view/download the guides [here](#).

- West Texas/South & Rolling Plains Production guide—Compiled by Calvin Trostle and about 10 Texas AgriLife colleagues, this guide also includes information for the Concho Valley
- High Plains Production Guide— For producers in the Texas Panhandle (Deaf Smith-Randall-Armstrong counties and north), as well as Oklahoma Panhandle and southwest Kansas. Brent Bean, Extension agronomist, Amarillo is a major contributor.
- Western Forage Production Guide—Written for West Texas, eastern New Mexico, OK Panhandle, western Kansas, and eastern Colorado. Compiled by agronomists Mark

Marsalis, NMSU-Clovis, and Brent Bean, Amarillo.

Request a free copy through either your county ag. agent, who may have copies on hand, or call United Sorghum Checkoff Program, Lubbock, directly at (806) 687-8727.

Extension Grain Sorghum Seeding Rate Guidelines

Farmer seeding rates for many grain sorghum fields, whether irrigated or dryland, are higher than they need to be. Extension's base seeding rate for dryland grain sorghum in the Texas South Plains when soil moisture is at its highest is about 30,000-35,000 seeds per acre.

Dryland—Depending on if and when we get any rain, when soil moisture is low for dryland sorghum then 2 seeds per foot on 40" rows, or 26,000 seeds/acre is a good target. This reduces the risk the crop burns up in a dry year, but is still high enough that if conditions turn favorable it will deliver a good yield.

Limited irrigation—Fields with target levels of irrigation in the range of 6-8" irrigation, an irrigation level that is common for grain sorghum in much of the South Plains, the following general guidelines reflect the level of stored soil moisture at planting:

- If soil moisture is low, especially for 2011, then target seeding rates at 40,000-45,000 seeds/acre
- If soil moisture is high, then target seeding rates at 50,000-55,000 seeds/acre

These are realistic targets that can deliver good yields, but they retain modest plant populations that are better equipped to handle very dry conditions like we see now.

Full irrigation—We rarely if ever recommend seeding rates over 80,000 seeds per acre even with the highest levels of irrigation. Even when full irrigation is planned, seeding rates may still be adjusted downward if available soil moisture at planting is low.

If you are debating whether to go with a higher seeding rate on grain sorghum, then it is probably wise to stay with a lower target seeds per acre.

Grain Sorghum Seed Metering on Air-Vacuum Planters—Verify your actual seed drop

As producers we rely heavily on the planter book settings to achieve our desired seeds-per-foot or seeds-per-acre guidelines for planting. This is true of most crops. However, Extension recommends that you check your seed drop annually for each crop. Recent Extension testing with air vacuum planters in the Texas South Plains—even on new John Deere—finds that there individual rows that still are $\pm 20\%$ of the target seed drop. At least you have the opportunity to check to see why that planter unit may be off and fix it before you seed several hundred acres.

Fertility Requirements for Grain Sorghum

Grain sorghum, like any other crop in the South Plains, has a couple of rules of thumb for key nutrient requirements. Limited fertility often holds back sorghum production when conditions are otherwise favorable for even modest grain yield potential.

The following are two general rules of thumb for grain sorghum fertility:

- Nitrogen—2 lbs. of nitrogen (N) per 100 lbs. of production—this is a combination of **both** fertilizer N and soil N. Unfortunately, Extension hasn't been always been clear on the fact that we mean the total of fertilizer and soil N rather than just applied N. Use your soil test N from at least the top 6", or deeper if you have it down to 24" or 36" depth.

Your soil N value will be dependent upon depth of the soil sample. The Texas A&M Soil Test lab calculation is as follows:

$$\text{N requirement} = \{(\text{yield goal in hundred weights}) \times 2\} - (2 \times \text{ppm N for 0-6"})$$

For example, your yield goal is 4,500 lbs. of grain per acre, and your soil test N for 0-6" is 9

ppm. Hence:

$$\text{N requirement} = \{(5,000/100) \times 2\} - (2 \times 9) = 100 - 18 = 82 \text{ lbs. of N fertilizer per acre}$$

The yield goal can also be adjusted for deeper soil N samples.

- Phosphorus— ~0.5 to 0.75. of P₂O₅ per 100 lbs. of production. This is a rough estimate. Our researchers have never developed an N rule of thumb like we have for grain sorghum.

For dryland production, N is the focus and P is usually disregarded. Phosphorus becomes more important once yield potential passes 4,000 lbs./A. For the same 5,000 lbs. per acre, P requirement would be about 25 lbs. of P₂O₅ equivalent.

Soil testing and recommendations for P fertilizer in Texas have been difficult for a long time, in part due to the diverse types of soils across the state (acid soils in east Texas, high pH and calcareous soils in West Texas). Texas A&M's soil test for P benefitted greatly due to the switch to Mehlich-III testing though this test has a broad range of 'Medium' P at 20-50 ppm. West Texas research notes the crop response 'transition zone' at 30-40 ppm P where crop yield response to fertilizer P is inconsistent. How you approach soil P fertilizer additions may depend on whether you have a 'Crop Requirement' vs. 'Build and Maintain' philosophy. This is why producers will see differences in soil test recommendations even though the same procedures and the same test values are obtained for the same soil sample. The former philosophy mirrors an approach of supplying what the crop needs for this year, whereas the building approach shifts towards a higher level of residual soil nutrient status for the long run. Each philosophy has its merits.

Timing of Fertilizer Application

Phosphorus is best applied preplant with incorporation in a fertilizer blend or perhaps

by the traditional starter fertilizer method of placing starter fertilizer 2" to the side and 2" below the seed. P fertilizer placed on the surface without incorporation is of little benefit in the year it is applied.

Nitrogen is a mobile soil nutrient. For dryland grain sorghum production, collectively as a group of farmers across the South Plains, we would probably all be better off applying N preplant. Otherwise we find reasons to apply no N at all, and yield potential may suffer. With preplant applications the least expensive form of N can be used and incorporation is more thorough.

But producers may prefer to wait until they are sure their crop is established before they spend the money on N fertilizer. In this case, for one-time applications of N (knife rig, rolling coulters, etc.), be sure to minimize nipping off roots. More importantly, perhaps, is to ensure N is applied within about 30-35 days of planting. This places the N in soil in advance of growing point differentiation, an important component of yield potential. Peak N uptake begins to occur as the sorghum plant progresses past the 10 leaf stage through about the end of boot stage.

If N can be applied through the pivot it is still recommended that much if not most of the N be applied by growing point differentiation. Some later N is acceptable, but it should still be applied by no later than boot stage, or about 60 days after germination. CT

FOCUS on South Plains Agriculture

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Useful Web Links

[Applied Research Reports \(Goldmine\)](#)
[Texas High Plains ET Network](#)
[Irrigation at Lubbock](#)
[IPM How-To Videos](#)
[Lubbock Center Homepage](#)
[Texas Agricultural Experiment Station Home](#)
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