AgriLIFE EXTENSION
Texas A&M System

TERRY COUNTY AG NEWS

MARCH 2011

209 South 5th Street | Brownfield, TX 79316 | Chris Bishop, Terry Co. CEA-AG
Phone: 806-637-4060 | Fax: 806-637-2588 | http://terry-tx.tamu.edu/

Immediate Halt in Temik Production

RESEARCH TRIANGLE PARK, N.C. (March 18, 2011) — Bayer CropScience today announced that the company has decided not to restart the transitional production of methyl isocyanate (MIC) at its site in Institute, West Virginia. As a result, the company will move forward immediately with decommissioning of the reconfigured MIC and associated production units as well as the closure of Woodbine. Bayer CropScience was planning to start the MIC unit and begin transitional production of the Temik® brand insecticide early this year, but uncertainty over delays has led the company to the conclusion that a restart of production can no longer be expected in time for the 2011 growing season.

The safety of the MIC plant, which was overhauled completely and technically modified during the past months, was confirmed again by a federal court-commissioned expert report on the plant's safety, which was delivered to the court this week. However, against the background of the continuing uncertainty regarding the timing of resumption of production, the company needed to make a decision.

"This was a very difficult decision, particularly as our employees did everything possible to ensure the operational safety of our newly constructed MIC unit during the remaining production period", said Achim Noack, member of the Board of Management of Bayer CropScience. "Our business case was based on our ability to supply the market needs beginning in 2011, and with the recent delays, that plan is no longer economically viable."

Following a 2010 agreement with the U.S. Environmental Protection Agency, Bayer CropScience agreed to phase-out Temik® and had timed production to end in 2012, to allow for an orderly market exit and meet immediate customer needs. This basic conclusion was based on a number of factors, with both strategic and economic considerations, and is fully in line with Bayer CropScience's global strategy to focus on delivering innovative solutions to modern agriculture and replacing older compounds in its portfolio, including WHO Class I products.

"We regret that the decision taken today to not restart production of MIC will not allow farmers access to Temik®," said Bill Buckner, President and CEO of Bayer CropScience in the United States. "However, we are committed to delivering the right solutions from our innovation portfolio in support of modern agriculture for our customers."

In This Issue:

Cotton Insects

Bt or Non-Bt Cotton

Undoubtedly the most effective means for controlling pink bollworms, bollworms, beet armyworms and fall armyworms is to plant a cotton variety containing Bt genes. These include those varieties containing Bollgard 2 (Cry1Ac + Cry2Ab), and Widestrike (Cry1Ac + Cry1F) technologies.

Depending on the circumstances, a grower may opt to not plant a Bt cotton variety. Reasons for this decision vary but include not wanting to pay the tech fee, no recent history with troublesome worm populations, choosing a non-Bt variety based on desired agronomic characteristics, or resistance to disease or nematodes. Regardless of the reason, there are many growers who do not plant much Bt cotton.

Is the cost of the tech fee worth it? Based on the Seed Cost Comparison Worksheet provided by PCG, (available at http://www.plainscotton.org/) and at a 52,272 seed/acre seeding rate, the tech fee for Bollgard II is $17.51 per acre alone, but roughly $8.60 when stacked with Flex, while Widestrike is $9.09 per acre. Depending on the insecticide selection, the cost for treating for bollworms (insecticide + application) runs about $8.00 per acre per application, while armyworms will cost about $13.00 per acre per application. However, when treating for bollworms with a pyrethroid, which is the most common treatment, you stand the chance of Flaring aphids and possibly mites. Aphids and mites will usually cost about $7.00 and $18.00 per acre to treat, respectively. Also, there is the "nickel and diming" damage low populations of worms cause. In most years we can get by without treating or may be have to only make a single application for bollworms on non-Bt cotton; but there is no guarantee. Additionally, Bt cotton is not immune to caterpillar damage. Although not common on the High Plains, we occasionally encounter Fields of Bollgard 2 or Widestrike that require insecticide oversprays for caterpillar control.

In addition to direct costs associated with spraying for worms in cotton there is the peace of mind factor and getting a good night's sleep not having to worry about worms. In essence, it's all a gamble and depends on how much risk you are willing to take to gain whatever benefit you see by planting a non-Bt variety.

Thrips

Preventive or foliar treatments for thrips

Deciding on whether or not to use a preventive thrips control product, and which one to use can be a difficult decision, and the benefit of these treatments is dependent on the weather and thrips pressure. Neither of which is predictable. However, you can make reasonable assumptions and guesses based on historical data and long-range forecasts.

Thrips build up populations primarily in small grains, flowering weeds and wild grasses; with wheat being the largest source of thrips, particularly during dry conditions. Once the wheat begins to mature and dry down, thrips will disperse out of the wheat in extremely high numbers, and will go to pretty much whatever is green in the area; notably newly emerging cotton. Thus, if you are growing cotton in area where a lot of small grains are produced, using preventive thrips treatments may be justified.

Another consideration when deciding on whether or not to use a preventive treatment for thrips is the weather. In 2007 we had a thrips test where cotton treated with Temik at 3.5 lbs/ac yielded 350 lbs-lint/ac more than an untreated check, but in 2008 similar studies saw no benefit from using Temik. Why the difference? Primarily temperature. During the 21 days post emergence in 2007, the average daily high and low was 82 and 54 °F, respectively; while in 2008 the average daily high and low was 94 and 58 °F, respectively. At the 2008 test location, we noticed that area cotton that had been planted 10 to 14 days earlier appeared to suffer significant thrips damage when growing under cooler conditions. Under warmer conditions, the cotton is simply able to outgrow some thrips damage. Thus, if you are growing cotton in an area that typically experiences cool temperatures and thrips commonly exist, then using a preventive treatment may be justified. However, if you are in an area where

Thrips damaged plant

made during one pre-plant cropping season and allow at least 30 days between applications. FirstShot has good activity on several weeds including cutleaf evening primrose, horseweed, and prickly lettuce. There is a 14 day preplant interval between application and planting.

Sharpen (saflufenacil) is currently registered as a preplant burndown treatment 42 days prior to cotton planting and during the fallow period following harvest. Sharpen can be applied preplant or preemergence in sorghum and corn. Previous studies have shown Sharpen can effectively control kochia (*Kochia scoparia*), Russian thistle (*Salsola iberica*) and horseweed (*Conyza canadensis*) when applied as a preplant burndown. Sharpen applied 42 DBP controlled kochia and Russian thistle 95 - 100%. The addition of 2,4-D, dicamba, or glyphosate was not needed to achieve effective control. No cotton injury was observed when Sharpen was applied 42 DBP at 1 oz/A. Injury (27-32%) was observed when Sharpen was applied at 2 oz/A at this timing. Sharpen applied at 1 oz/A 14 or 28 DBP injured cotton 30- 38%. The use of in-furrow insecticides at planting did not affect cotton response to Sharpen applied 42 DBP.

In a study conducted at Lorenzo in 2010, 2,4-D (16 oz) plus Roundup (22 ounces) controlled horseweed (marestail) 87% two months after application. When the tank mix combination of 2,4-D increased to 32 oz, control increased to 94%. 2,4-D alone (16 or 32 oz) or Roundup alone (22 or 32 ounces) controlled this weed less than 75%. Other herbicide combinations that controlled horseweed 83 to 86% were: 1) Valor (2 oz) + Sharpen (1 oz) + Roundup (22 oz), 2) FirstShot (0.66 oz) + 2,4-D (16 oz), or 3) FirstShot (0.75 oz) + Roundup (22 oz).

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.

Peter Dotray,
Extension Weed Scientist
Wayne Keeling,
Research Weed Scientist

The articles are from a recent issue of FOCUS on South Plains Agriculture, a weekly newsletter from the Lubbock Research and Extension Center. http://lubbock.tamu.edu/focus

FOCUS Editors—David Kerns and Patrick Porter

Ag Businesses: *Please post this newsletter in your office and forward to your e-mail database.*

Continued from page 9

to select the proper herbicide(s) for the weeds that need to be controlled.

The use of Prowl (pendimethalin) or Treflan (trifluralin) is the first step towards successful weed management programs in cotton. The strength of dinitroaniline (DNA) herbicides is annual grass control (barnyardgrass, crabgrass, foxtails, panicums, etc.) and control of small-seeded broadleaf weeds such as Palmer amaranth (carelessweed and other pigweed species), Russian thistle (tumbleweed), and kochia (ironweed). Most larger-seeded broadleaf weeds, like annual morninglories, cocklebur, and sunflowers, and perennial weeds are not controlled by these herbicides.

The rate of each DNA herbicide is dependent on soil type. The sandier the soil, the lower the recommended rate. If soil conditions are dry and large clods are present during mechanical incorporation, herbicide performance will be less effective. Keep in mind that when Treflan was first used over 35 years ago, farmers were diligent with two-pass incorporation prior to bedding and planting. This resulted in thorough mixing of the herbicide and excellent weed control. In recent years many farmers have cut back on incorporation to save time and money. Some have still achieved adequate weed control while others have observed that poor incorporation allowed for more weed escapes. In cotton, Prowl EC rates range from 1.2 to 3.6 pints per acre in conventional or minimal tillage and from 1.8 to 4.8 pints per acre in notillage. Rates for Treflan and other trifluralin products (formulated at 4 pounds per gallon) range from 1/2 to 1 pint per acre for sandy soils, and up to 2 pints per acre on other soils.

The DNA herbicides may be incorporated by mechanical means or by irrigation. Incorporation methods vary widely across the High Plains and across the state. A double-pass method of incorporation is recommended and is most commonly used. Mechanical implements used to incorporate these herbicides include a springtooth harrow, a disk, a double or single stalkcutter, and a rolling cultivator to name a few. The better the implement mixes and uniformly distributes the herbicide in the upper 1- to 2-inches of soil, the better the weed control. Treflan should be incorporated within 24 hours after application. Prowl must be incorporated within 7 days after application, but the sooner the better. Prowl EC may be surface applied and then incorporated by rainfall or irrigation. Three-quarters to one-inch of irrigation is necessary to incorporate (activate) these herbicides. Both Prowl EC and Treflan may be chemigated into the soil. Although water may not be the best way to incorporate Prowl or Treflan, this may be the only way to use these herbicides in a reduced tillage or no-tillage crop production system. When surface applications followed by irrigation or chemigation methods are used, herbicide rates are generally higher when compared to mechanically incorporated methods. Research conducted at the AG-CARES farm in near Lamesa by researchers with Texas *Agri*LIFE Research suggested that Prowl EC provided more consistent weed control when compared to Treflan when surface applied followed by irrigation for activation, but Treflan performed better than Prowl EC when chemigated.

Prowl H20 is the newest formulation of pendimethalin. One gallon of Prowl H20 contains 3.8 pounds of pendimethalin formulated as an aqueous capsule suspension. Since it formulated at a higher concentration than Prowl 3.3 EC, less product is needed on a per acre basis in general. In cotton, Prowl H20 may be applied in conventional, minimum, stale seedbed, or no-till systems as a preplant surface, preplant incorporated, preeemergence, or at layby. It may be applied by ground, air, or chemigation. Use rates vary from 1 to 3 pints per acre in conventional or minimal tillage and 2 to 4 pints in no-till depending on soil texture. Valor is labeled as a burndown option preplant in cotton. Valor may be used at 1 to 2 ounces per acre with labeled burndown herbicides like Roundup and 2,4-D to enhance the speed of burndown, widen the spectrum of weed control, and provide residual weed control. Do not till after application or the residual weed control may be reduced. A minimum of 30 days and 1 inch of rainfall/irrigation must pass between application and planting in conventionally tilled cotton. In no-till or strip-till cotton, a minimum of 14 days plus 1 inch of rainfall/irrigation must occur between application and planting when 1 ounce of Valor is used or 21 days must occur between application and planting when 1.5 to 2 ounces is used. Valor has soil residual activity on several broadleaf weeds including chickweed, dandelion, henbit, marestail, pigweed, primrose, mustard, and sheperdspurse.

DuPont FirstShot may be applied as a burndown treatment to control emerged weeds prior to planting. FirstShot at 0.5 to 0.6 ounces per acre may be applied in tank mix with other registered burndown herbicides (Roundup, 2,4-D, Ignite, paraquat) or may be applied at 0.5 to 0.8 ounces alone. Sequential treatments not to exceed 1 ounce per acre may be

thrips populations are not normally severe and temperatures are relatively warm, you may opt for foregoing preventive thrips treatments and use curative foliar sprays as needed instead.

Things to consider when using foliar applications for thrips control

Timing can be critical.

Controlling thrips during the First 2 weeks post crop emergence appears to be the most important period; especially under cool conditions. You need to be "Johnny on the spot" with these applications when thrips are numerous; even a few days' delay can be detrimental.

Spray based on thresholds.

Use an accepted action threshold to help you determine whether or not you should treat.

Cotton stage	Threshold
Cotyledon-1 true leaf	0.5 thrips/plant
2 true leaves	1 thrips per plant
3 true leaves	1.5 thrips per plant
4 true leaves	2 thrips per plant
5-6 true leaves	Rarely justified

Avoid automatic treatments.

Automatically adding a foliar thrips material in with a Roundup application may not be necessary or may be poorly timed. Often either the weeds aren't present when the thrips are or vice versa.

Scout for thrips.

Go out and visual assess if thrips are present. Pull up plants and thoroughly search them or beat the plants inside a plastic cup.

Don't spray based on damage.

The damage you see today happened 3 to 5 days earlier and you may have already suffered yield loss. Spraying based on damage is essentially a revenge treatment.

Seed treatments for thrips

With the possibility of Temik being in short supply, there is increased interest in seed treatments this year. The good thing about seed treatments is that they are easy to use, require no special equipment, and are fairly safe to handle. Seed treatment options for thrips control include Gaucho Grande, Cruiser, Avicta Complete Cotton, Avicta Duo Cotton, and Aeris. The length of thrips control will vary by product, soil moisture, precipitation, and thrips pressure. Additionally, your choice of a seed treatment should consider nematode and disease potential as well.

Depending on which seed company you are obtaining seed from, you will have different options on seed treatment. Let's look at what the various seed treatments bring to table in regard to thrips control.

Gaucho Grande (imidacloprid) is a widely used thrips control product in many parts of the cotton belt, but tends to be weak against western Flower thrips which is the predominant thrips in the Texas High Plains. For us, Gaucho Grande will usually provide about 7 days post emergence thrips control. However, if you end up with primarily onion thrips instead of western Flower thrips as was the case in many areas last year, you can expect Gaucho Grande to perform equally to the other seed treatments.

But because you don't know which species of thrips will show up, you need to plan for the worst; western Flower thrips. For his species, the better thrips control seed treatments include the Cruiser, the Avicta products and Aeris. Cruiser contains the single active ingredient thiamethoxam, and is in the same insecticide class imidacloprid. However, Cruiser is more active towards western Flower thrips than Gaucho Grande and will provide 14 to 18 days post emergence thrips control.

Aeris is a combination of imidacloprid and thiodicarb. Imidacloprid is the same active ingredient as Gaucho Grande, but the inclusion of thiodicard significantly increases the length of control of Aeris over Gaucho Grande to 14 to 18 days post emergence control. Thiodicarb also has some nematode activity. Prior to 2009, Aeris seed treatments automatically included the inclusion of the premium fungicide Trilex Advanced, but now Aeris can be applied separately.

Avitca seed treatments are available in two options, Avicta Complete Cotton and Avicta Duo Cotton. As far as thrips are concerned, these products are identical and are the same as Cruiser. They have the same active ingredient as Cruiser for thrips (thiamethoxam), and like Cruiser, will provide 18 to 21 days of post emergence thrips control. The differences among Cruiser, Avicta Complete Cotton and Avicta Duo Cotton are the other active ingredients. Both of the Avicta products, in addition to thiamethoxam, include abamectin for nematode management, and Avicta Complete Cotton also includes the premium fungicide treatment Dynasty CST.

Regardless of the seed treatment utilized, keep in mind that effective control will usually not last more than 21 days under constant thrips pressure, and follow-up foliar sprays may be necessary to protect the crop once these treatments wear off.

David Kerns, Extension Entomologist

Cotton Agronomy

Recap of 2010 Crop

According to recent National Agricultural Statistics Service data (NASS), cotton producers in the High Plains region planted around 3.73 million acres in 2010. Estimated harvested acres were 3.56 million for the region which is a recent record due to only 4.6% of planted acres abandoned. The January estimate for total production was 5.54 million bales, which if it stands, will be the second highest production for the High Plains. The 2010 crop year in the High Plains was excellent. Most producers did very well with irrigated cotton and due to above average winter and early spring precipitation did not have to initiate irrigation until sometime in June. The dryland acreage in some areas had difficulties with stand establishment due to dry/windy conditions following planting. Results from the Lubbock and Lamesa classing office indicate excellent fiber quality for 2010. We ended up with around 84% color grades 11 or 21, substantially higher than the 54% observed in 2009. Average leaf was somewhat improved compared to last year with 95% leaf grade 3 or better (75% in 2009). Length was unchanged compared to 2009 with a 35.8 staple average. However, record strength was observed in 2010 with an overall 30.07 g/tex average. Micronaire, an indirect measure of maturity, was excellent with an average value of 4.09 with only 9% 3.4 or lower and only 4.6% of 3.2 or lower.. However, due to the difficult Fall, and the lateness of much of our remaining dryland and some irrigated fields, we encountered significant maturity issues in some areas. As of February 15, average micronaire weighted for both Lubbock and Lamesa Classing Offices was 3.72, with 31.3% at 3.4 or below, and 22.9% at 3.2 or below. Uniformity was approximately 80%. Bark contamination for 2010 (9%) was down substantially from 2009 (32%).

Winter precipitation in the High Plains has been below normal, and we are seeing some pre-watering taking place. If we do not see some significant moisture soon, dryland establishment will be difficult at best. In my opinion, cotton production is a complicated job. Just make sure that you do your homework and spend input money wisely. With that said, producers need to be aware especially in District 1N that managing for earliness should be the major focus during the growing season. Prior to 2010, several years of crops with substantial amounts of long, immature fiber for which is generally difficult to obtain good prices in the global market have been produced. However, in 2009, many producers with low micronaire cotton were saved by an active market. That market has continued to improve and producers are receiving excellent prices for their lint. Although we cannot control weather impacts, selection of varieties which tend to be somewhat earlier in maturity and managing those varieties for earliness should help. Excessive irrigation amounts, especially late, can push a lot of late set bolls (which contain much immature fiber with poor length distribution) to the point of providing some pounds of yield at the sacrifice of overall maturity. This is a difficult box that we need to find a way out of in order to improve crop quality for global markets. If producers have specific Verticillium wilt or fusarium wilt disease issues with which they are dealing, results from trials conducted under high disease pressure are available. It is important for growers to consider managing individual fields based on the specific disease presence or absence and overall goals.

Variety Selection Process

Selecting productive cotton varieties is not an easy task especially in the Texas High Plains, an area where weather can literally "make or break" a crop. Producers need to do their homework by comparing several characteristics among many different varieties, and then keying these characteristics to typical growing conditions. We can't control our growing environment from year to year, but we can select the varieties we plant based on desired attributes. It is very important to select and plant varieties that fit specific fields on your operation. Don't plant the farm to a single variety, and try relatively small acreages of new ones before extensive planting. **Don't forget to target specific diseased fields with the best varieties under those conditions.**

Variety Testing Publications

If disease issues are not concerning, then scrutinize all possible university trial data that are available to see how a specific variety has performed across a series of environments, and if possible, across years. It is best to consider multi-year and multi-site performance averages when they are available. However, due to the rate of varietal release, many new varieties are sold which have not undergone multi-year university testing, or perhaps no university testing at all.

Dr. Jane Dever has published the Cotton Performance Tests in

Another, economically important disease throughout the south western part of the region is fusarium wilt (caused by the soilborne fungus *Fusarium oxysporum* f. sp. *vasinfectum*). Severe Fusarium wilt damage only occurs in fields that are also infested with root-knot nematode; hence losses are more severe on root-knot susceptible varieties. Symptoms of Fusarium wilt can be confused with Verticillium wilt; therefore, proper disease diagnosis is required. For more information regarding diagnosis see the bulletin 'Diagnosis and Management of Vascular Wilts of Cotton'. One subtle difference is that seedling mortality may be observed with Fusarium wilt. Therefore, management options that are employed to minimize nematode damage are often integrated into Fusarium wilt management strategies. For example, the use of nematicides results in higher stands, lower disease incidence, and greater yields. While nematicides have no direct effect on *Fov* the benefit comes from reducing damage caused by the nematode. Furthermore, results from trials conducted in fields infested with *Fov* have found that varieties which posses partial resistance or improved tolerance to root-knot nematode consistently perform well, as do varieties that seem to have resistance to the fungus, such as Stoneville 4554B2F. Results from the previous Fusarium wilt trial results can be accessed here.

Seedling diseases occur every year in west Texas. While, substantial losses are seldom experienced, cool wet conditions after planting can increase seedling disease. Symptoms associated with *R. solani* and *Pythium* spp. are similar, and can be observed on young seedlings. Initial symptoms consist of sunken lesions at the soil level, resulting in girdling and collapse of the stem. In addition, black root rot (caused by *Thielaviopsis basicola*) can be experienced on the Southern High Plains. Plants infected with *T. basicola* may also exhibit severe necrosis on roots, severe stunting and swelling of the cortex; however, plants are rarely killed. Black root rot is more severe in the presence of the root-knot nematode. This is due primarily to the effectiveness of the fungicide seed treatments that come with commercial seed. Different seed companies use different seed treatment fungicides; however, most all have activity against the primary seedling diseases Rhizoctonia, Pythium and Black root rot. For 2011, Fibermax and Stoneville varieties will be treated with a combination of Vortex combined with Baytan and Allegiance FL. Bayer CropScience will also offer Trilex Advanced as an overtreatment. The base seed treatment for Deltapine is comprised of pyraclostrobin, trifloxystrobin, metalaxyl, and myclobutanil, with their overtreatment Acceleron being available in the future. Americot and NexGen varieties will be treated with Maxim, Apron, Systhane, Nusan, and Lorsban. Syngenta is offering the additional fungicide treatment Dynasty CST which contains axozystrobin, Fludioxonil and mefenoxam. If you have any questions about any of the cotton diseases, variety selection or seed treatment options, contact Jason Woodward at 8066320762 or via email jewoodward@ag.tamu.edu.

Jason Woodward, Extension Plant Pathologist

Cotton Weed Control

Importance of Preplant Weed Control in Cotton

It is nearly impossible today to pick up a trade magazine without an article written about the development of Roundup -resistant weeds. To date, there are 11 different weed species and an additional 10 worldwide that have been confirmed to be resistant to Roundup (http://www.weedscience.org/in.asp). Our biggest concerns are likely Palmer amaranth, kochia, Johnsongrass, and marestail. One of the main reasons for the selection of herbicide - resistant weeds is the heavy and sometimes sole reliance on a single herbicide to control weeds over the course of the growing and over several years. Growers on the Texas High Plains have done a good job using several weed management strategies to control weeds and not relying on Roundup as the only tool. Although the amount of cultivation has declined for understandable reasons, we still see plowing and cultivation as an effective strategy against the development of herbicide resistant weeds. We also see the benefit of using other "mode -of -action" herbicides as an important part of successful weed management and as an effective weed -resistance strategy. One of the key herbicide timings with an alternative mode -of -action is the use of preplant herbicides. Effective preplant weed control will conserve soil moisture, allow planting operations to occur without the interference of weeds, and help to provide the critical weed free periods for the first six to eight weeks after crop emergence. One of the major challenges of using herbicides preplant is to ensure that herbicide activity in soil will not reduce crop germination and emergence. A second challenge is

Continued on page 10

Cotton Diseases

To echo a comment from Dr. Randy Boman's March 11, 2010 Focus article, "producers need to do their homework" when it come to variety selection. This statement holds true for all aspects of production including reviewing variety performance data such as maturity, plant management, yield potential, fiber quality, storm resistance, herbicide and insecticide traits, as well as disease and nematode susceptibility. When looking at variety data, keep in mind the objective of the studies when they were conducted, especially as it relates to choosing varieties to plant on farms with specific disease problems. As there is no 'silver bullet' variety, it is important to properly identify disease problems within a field, thus allowing you to choose the variety that best fits the situation.

Summary of common diseases

There are several diseases that commonly occur on the Southern High Plains of Texas. Verticillium wilt, Root-knot nematodes, Bacterial blight and Fusarium wilt, as well as the seedling disease complex. Losses to Verticillium wilt have increased over the last several years, making it the most economically important disease of cotton during that time. Leaves of plants infected with the Verticillium wilt pathogen (*Verticillium dahliae*) appear wilted and exhibit a yellowing between the veins before becoming necrotic. As the disease progresses, stems of infected plants will have a discoloration of the vascular system. Infected plants will also appear stunted and in some cases may defoliate prematurely and death may occur. The fungus survives in the soil as specialized structures (microsclerotia), which germinate in response to moisture and root growth. Great strides have been made the last 4-5 years to identify varieties that possess partial resistance or tolerance to the disease. Dr. Wheeler's, 2010 variety trial results show that there are several commercially available varieties that perform constantly well in fields with a history of Verticillium wilt with new varieties such as Fibermax 2484B2F, NexGen 4111RF, and Phytogen 367WRF ranking 1st, 2nd and 3rd in last year's trials, respectively. There are also experimental varieties from Deltapine and Fibermax that show some promise. Although variety selection is paramount in Vertcillium wilt management, other production practices may also influence disease development. A preliminary report on the affect of irrigation, seeding rate, crop rotation, and fertility on Verticillium wilt is currently available and will be updated as newer information is made available. Advances in breeding programs have also yielded varieties that have partial resistance or improved tolerance to the root-knot nematode (*Meloidogyne incognita*). Varieties such as Deltapine 174RF, Phytogen 367WRF, Stoneville 4288B2F and Stoneville 5458B2F have partial resistance and/or improved tolerance. Results from 2010 root--knot nematode trials are available. Symptoms associated with root-knot damage include stunting, poor vigor, yellowing of leaves, and wilting, which may be confused with a nutrient disorder or deficiency. One characteristic that can be used to identify root-knot nematode is the formation of small galls that form on the root after the female nematode initiates a feeding site. The amount of damage observed in the field is more severe when there are higher populations of the nematode in the soil. Nematode damage is often enhanced when plants are experiencing other early season stresses. Temik 15G is recommended at planting for fields with moderate or high risk level. Seed applied nematicides such as Avicta and Aeris are also labeled, but have been shown to be most effective under low nematode pressure. The pending loss of Temik means that variety selection will have a large impact on nematode management. Research efforts will continue to focus on screening varieties and identifying options that can be integrated together to manage the nematode.

While sporadic in its occurrence, Bacterial blight (caused by *Xanthomonas campestris* pv. *malvacearum*) can also adversely affect yield and fiber quality. Cotton plants are susceptible to infection at all developmental stages. Stand losses and reduced vigor can be experienced if infections occur during the seedling stage. Symptoms include small, dark green, watersoaked spots that are first visible on the underside of leaves. These lesions, which have an angular appearance and are delimited by the veins, later become present on the upper leaf surface. As the disease progresses, a second leaf symptom (referred to as 'Black arm') can be observed along the main vein. As individual lesions coalesce and become necrotic, infected leaves will defoliate prematurely. In addition, watersoaked lesions can develop on infected bolls. These infections often result in a boll rot. There are no chemical management options available for Bacterial blight. The disease is currently managed through the use of resistant or immune varieties, and here is a publication.

the Texas High Plains and Trans Pecos Areas of Texas 2010 report. This report contains data on numerous entries in some 13 small plot trials. Small plot trials enable producers to observe results from a large number of entries at multiple locations. These trials are normally conducted under uniform, disease-free conditions, unless a test is specifically targeted toward a certain disease. Dr. Dever has included summaries over locations for some sets of trials. This is an outstanding resource and provides much information on variety performance, including lint turnout, fiber quality, earliness, plant height, and storm resistance. Results from locations with Verticillium wilt, Root-knot nematode, and Bacterial blight are also available in this publication.

The Extension 2010 Systems Agronomic and Economic Evaluation of Cotton Varieties Report is also available. This report contains approximately 30 locations of replicated cotton demonstrations conducted by Extension agents in producer-cooperator fields across the region. Since these trials are planted and harvested with producer-cooperator equipment, the number of entries per site is generally less than 15, and many times less than 10. However, these trials reflect a wide range of cultural practices, locations, irrigation types, etc. The absence or degree of presence of disease is affecting results of some Extension variety demonstrations, and taking the time to read the site descriptions is becoming as important as looking at the results tables. There are tables that summarize data for yield, micronaire, staple, uniformity, and strength across locations. These tables provide a quick glance at the performance of each entry at the respective locations.

Also included in this report are results from the 2010 picker vs. stripper harvester comparisons. Dr. John Wanjura with the USDA-ARS Cotton Production and Processing Research Unit at Lubbock provided the picker harvester and expertise for harvesting these trials. Picker vs. stripper harvester comparisons were conducted at 5 producer-cooperator sites in 2010 and at one site in cooperation with Dr. John Wanjura with the USDA-ARS.

When it comes to variety selection in the High Plains, several factors are important to consider.

Maturity (Earliness)

We can't predict the weather, but producers should recognize that 2001, 2002, and 2003 were record high micronaire years in the High Plains and things have changed a lot since then. More recently, we have experienced higher yielding crops with lower maturity as seen in lower average micronaire. **Producers should be looking very hard at the relative maturity and micronaire values of the new varieties.** Scrutinizing the relative maturity rankings provided by seed companies will be beneficial. Don't expect a mid-full season cotton variety to perform well in a short season environment where an early or early-mid might generally work best. Many longer season cotton varieties are better adapted to areas with longer growing seasons, although significant gains in yield may sometimes be obtained in years with warm September and October temperatures. In years such as 2009, with a difficult finish due to poor maturing weather at the end, many fields planted to some of these varieties had somewhat lower yield and more immature fiber resulting in lower micronaire. In 2010, however, we had an excellent finish with above average temperatures in August, September, and October. This resulted in micronaire values averaging around 4 in most of the region. Dr. Dever's cotton performance test report contains an earliness evaluation (expressed as percent open bolls on a given date). These results are provided across all locations.

Pounds

Yield potential is probably the single most important agronomic characteristic, because pounds do drive profitability and provides for the safety net of higher actual production history (APH) in case of catastrophic loss of acres. The benefit this can provide from the crop insurance perspective is important in our high risk area. Yield stability across environments is going to be important, and basically what we want to find is a variety that has the ability to provide high yield across varying water inputs.

Fiber Quality

Producers should also consider lint quality. We have made a lot of progress in terms of fiber quality over the last several years, but we still have a long way to go to address maturity. A lot of things can affect crop micronaire. These factors can include overall environment, planting date, variety, early season fruit loss with later compensation, excessive late season irrigation or rainfall, seedling disease, early season set backs due to hail damage, blowing sand, thrips, etc. Verticillium wilt disease incidence can also be a contributing factor. This in turn can be aggravated by excessive nitrogen fertilization and/or soil residual nitrogen. There is good evidence that excessive nitrogen fertilization may also play a role in immaturity. There are comments

below concerning testing for residual nitrogen.

Storm Resistance

Storm resistance is still a concern for growers in our area. Even though we have adopted less storm resistant cotton varieties over the last several years, and generally done well with those, the overall management system the producer adopts can be important. Producers planning to execute a sound harvest aid program as soon as the crop is mature can probably grow some fields of less storm resistant cotton. However, having large acreages of low storm resistant varieties might be a prescription for disaster if the right environmental conditions align at harvest. Do not plan to leave looser open-boll cottons in the field until a freeze conditions the plants for harvest. Unacceptable pre-harvest lint loss is likely to result. More storm resistant varieties are better adapted to our harvesting conditions and they are more likely to survive damaging weather prior to harvest without considerable lint loss. Inquire about the storm resistance of any variety on your potential planting list. If you do choose an open-boll variety, plan and budget ahead for a good harvest aid program that will let you achieve an early harvest. Good storm resistance data are now being provided by most companies and results from Dr. Dever's cotton performance testing program are valuable for looking at several varieties across location. New for 2010, the Systems Agronomic and Economic Evaluation of Cotton Varieties in the Texas High Plains also contains visual observations for storm resistance at several locations. With some growing interest in picker harvesting, excessive storm resistance can be a negative and possibly result in reduced picker harvesting efficiency.

Biotech Trait Types

Producers need to ask themselves several questions. Do I want a herbicide-tolerant variety? If so, which system? Weed control has been catapulted forward by the advent of transgenic Roundup Ready Flex and Liberty Link cotton varieties. The agronomic capabilities of Roundup Ready Flex cotton varieties continue to improve. The Liberty Link system has been more widely adopted in other areas, perhaps due to our tough early season environment in some years. Good to excellent varieties with these herbicide traits are out there. The widely anticipated GlyTol glyphosate tolerance trait from Bayer CropScience (BCS) has been approved by and will be sold in our region in 2011. As for insect protection, the Bollgard 2 and Widestrike technologies have provided outstanding lepidopteran pest control. Based on our local pricing, these technologies should be considered, especially for irrigated farms.

Conventional Varieties

Some offerings of conventional varieties are still being made by a few seed companies. The companies of which I am aware include All-Tex Seed in Levelland. They are selling several conventional varieties in 2011, identified as 1203, A102, LA122, and OL220. Older conventional varieties such as Xpress, Excess, Atlas, and TopPick are also available. Additional conventional varieties are being sold by Seed Source Genetics located in Bishop, TX. Some of these varieties have been tested in Dr. Jane Dever's performance trials.

Ease of Management

Plant type should be considered because of substantial variation in available water input across the region. Under high water inputs, some varieties can get "growthy" and require diligence with regard to plant growth regulator (mepiquat chloride) application. Other varieties may be more compact and not as large. Some growers like the challenge of managing some of these "growthy" types, and some do not. Smaller plant types are generally easier to manage and require less plant growth regulator expense for growth control.

Seed and Technology Cost

Cost should not necessarily be the primary reason for selecting a variety, but it is important. The value of a high yielding cotton variety with biotech traits to ease management requirements across a large number of acres is a serious consideration. Over the last several years, we have seen significant producer gravitation to transgenic varieties. Based on the USDA Cotton Varieties Planted 2010 Crop report, Bollgard 2 was planted on approximately 53% of the acres served by the Lamesa and Lubbock Classing Offices. Approximately 85% and 69% respectively for the Lubbock and Lamesa Classing Office territory was planted to Roundup Ready Flex. We have a large number of commercial varieties from several companies being sold in our region in 2011. About 107 varieties are available. Many of these contain Roundup Ready Flex technology, many contain Bollgard 2/ Roundup Ready Flex stacked traits, some with Liberty Link and Liberty Link/Bollgard 2 stacked, some with Widestrike/Roundup Ready Flex stacked, etc. There is still some overlap of Widestrike/ Roundup Ready out there, but with the recent producer gravitation to Roundup Ready Flex technology, these varieties are diminishing.

Whether a producer chooses to plant a conventional or a transgenic variety, the Plains Cotton Growers 2011 Seed Cost Comparison Worksheet can certainly be useful. Shawn Wade developed the Microsoft Excel spreadsheet which can be used within your Web browser, or downloaded and saved to your computer. There are about 107 varieties of many types in the spreadsheet. The user can select up to 9 varieties to simultaneously compare total seed and technology fee costs based on a specific seeding rate. The row spacing and seed per row-ft can be entered by the user. This then calculates a seed drop on a per acre basis. Then, based on published pricing for the various seed varieties and technology fees, the cost per acre is automatically calculated. The 2010 Seed Cost Comparison Worksheet is available at www.plainscotton.org.

Deep Soil Sampling for Residual Nitrates

With fertilizer prices skyrocketing in 2008, and possibly again in 2011, special emphasis is being placed on reminding producers about proper soil sampling and testing techniques. One of the most costly fertilizers is nitrogen (N). Nitrogen is important for producing protein in plants and crop demand is very much yield driven. Establishing a realistic yield goal is the first task. Producers shouldn't take the attitude that cotton is like a grain crop. The more nitrogen applied when given high water doesn't necessarily translate into higher yield. Many times we can retain the fruit in a high water input field but not have time to mature that fruit. This results in a large number of pounds of lint, but can significantly reduce maturity because the late-set bolls do not have adequate time to mature. Excess N can aggravate the problem by delaying crop maturity, especially if poor maturity weather is encountered in September and October as was the case in many fields in 2009. There is a fine line between obtaining an adequate yield and having good maturity in the crop, especially north of Lubbock. Excessive N can result in 1) Unwanted crop growth which in turn will require plant growth regulator (such as mepiquat chloride) application especially on varieties that are inherently "growthy", 2) Increased Verticillium wilt problems, 3) Increased aphid problems, and 4) More harvest aid challenges at the end of the season.

Over the last several years agronomists across the state working in cotton have been surveying residual N in the soil profile in producer fields. What many fields are exhibiting is a considerable amount of N that should be accounted for when determining how much N fertilizer to apply. In our region, many fields may encounter this deep N somewhat later in the season resulting in a surge of green at a time when we would like for the fields to become more N deficient. Based on research projects this is likely a contributing factor to lower micronaire in some fields in years with poor maturing conditions.

The basic formula for success is this: 1) Determine the yield goal in bales per acre for the field based on irrigation capacity, varietal performance, early season profile moisture, etc. 2) Multiply this yield goal times 50 pounds of N per bale of production. 3) Deep sample for residual soil N down to the 18-24 inch depth. 4) Submit the samples to a soil testing laboratory, fully recognizing the depth that the sample represents. 5) Use the appropriate conversion factor based on the depth of sampling to convert the nitrate-N test results from the laboratory to pounds of N per acre If the laboratory does not provide this service. 6) Subtract the amount of residual N found from the N fertilizer needed based on the yield goal. If high nitrate-N irrigation water is used, then additional steps must be made to compensate for N delivery during the growing season. Based on 10 ppm nitrate-N concentration in irrigation water, application of an acre-ft (12 acre-inches) during the growing season will result in about 27 pounds of N being simultaneously applied. Few High Plains wells will have nitrate-N concentrations of that magnitude. However, with high fertilizer prices, the water should be checked and credits made for this against overall N fertilizer application. There is a publication which deals with this issue entitled Nitrogen Management in Cotton SCS-2009-2. It discusses in an in-depth manner much of the information in the previous paragraph. In 2009 and 2010 a deep sampling campaign took place across the region where 113 fields were sampled to 24” and residual N was determined. Of those 113 fields, 17 were dryland and 96 were irrigated. For the irrigated, 6 were furrow, 29 were sub-surface drip, 36 were Low Energy Precision Application (LEPA), and 25 were Low Elevation Spray Application (LESA). Overall average total residual nitrate-N was 43 lbs NO3-N/acre dryland and 52 lbs NO3-N/acre across all irrigation methods.

Mark Kelley, Extension Cotton Program Specialist