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Wheat Newsletter

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Unfortunately, the wheat crop remains in poor condition across most of the Texas. According to Texas Agricultural Statistics Service, 63% of the crop is poor to very poor, 27% fair, and 10% good to excellent. Across the state, wheat varies from the flowering stage in South Texas to prejointing in the High Plains. Unfortunately, a similar range of growth stages (flagleaf to early tillering) also exists within many of the wheat production regions due to very limited fall and winter precipitation. The best dryland wheat in the state is in the northern Blacklands. Much of the rest of the state is at varying levels of drought. Although extremely drought stressed, most of the wheat that emerged in the fall and has an adequate stand still has decent yield potential (at or slightly below the county averages), if we can get a good rain in the next 7 days in Central Texas and within the next 2 weeks in the Rolling Plains and temperatures are cooler this spring. In the High Plains some fields need rain immediately, while others may get by for another couple of weeks. However, wheat that emerged in January or February, and has remained under drought stress, has very low and in many cases, no yield potential. Important management decisions now need to be made on this late emerged wheat. Below are some comments to consider for the current wheat crop.

In wheat fields with poor stands or newly emerged wheat, the producers should expect no to very low yields. Low yields will be the result of poor vernalization (plant will not convert to the reproductive stage), moisture stress, and delayed maturity. With recently emerged wheat, odds of vernalization occurring is very limited, but depend on the wheat variety. See Table 1 for vernalization ratings for the common hard red winter wheat varieties. If vernalization does take place, then one of several things will occur 1). limited additional tiller development will occur, 2). plant height will likely be short to very short, 3). Seed head will likely be very small, and 4) maturity will be delayed and yields will likely be negatively affected by heat stress. If we have cool temperatures and adequate moisture during flowering through grain fill, then the wheat plant will compensate to some degree with more grain in the head.

Table 1. Vernalization ratings for 2008*.

Variety	Vernalization (0-5)**	Variety	Vernalization (0-5)*	Variety	Vernalization (0-5)*
Longhorn	4	HG-9	5	TAM 112	2
Ogallala	3	Jagger	1	TAM 304	3
Coronado	4	Jagalene	2	TAM 401	1
Cutter	3	KSU 2145	2	Sturdy 2K	4
Deliver	3	Longhorn	4		
Doans	2	Overley	1		
Dumas	3	TAM 101	2		
Endurance	5	TAM 105	4		
Fannin	1	TAM 110	3		
Fuller	2	TAM 111	4		

* Ratings by Jackie Rudd and Ravindra Devkota, Wheat Breeding Program, Amarillo, TX.
** 1 = low vernalization requirement
5 = high vernalization requirement

What is vernalization: Winter wheat varieties require up to 45 days (1080 hours) accumulated exposure to temperatures between 45 to 32^{o} F at the growing point to vernalize. Vernalization begins when the seed begins the germination process, when water is absorbed by the seed. Without adequate vernalization, winter wheat plants will remain vegetative and will not produce grain. Non-vernalized wheat will exert heads much later than normal and heading is very erratic, if it occurs at all. Vernalization requirements differ by variety. The exact number of vernalization days for most wheat varieties are not known. See Table 1 for relative comparisons of wheat varieties. Generally, early maturing wheat varieties require less vernalization than later maturing varieties. For example, most dual-use wheat varieties are later maturing and require more chilling hours to vernalize.

Is there still time for vernalization to occur?: For example, in San Angelo at annual average temperatures, wheat that emerged on March 1st would optimistically have 228 vernalization hours. Therefore, some of the very low vernalization wheat varieties may vernalize; however, the yield potential will be substantially reduced due to delayed maturity and heat stress. It is highly unlikely that wheat varieties, such as Hardeman Grain 9, Weathermaster, WinTex, Sturdy 2K, and late maturing OSU varieties, will ever vernalize if they emerged around March 1st or later.

How to determine if the wheat has vernalized: If a wheat plant has not received adequate chilling to vernalize, then the developing seed head (spikelet) and corresponding stem joints will not be present within the stem. The seed head development and jointing varies by variety and geographic location. The publication entitled "Growth Stages of Wheat" at http://varietytesting.tamu.edu/wheat/docs/mime-5.pdf. provides some good pictures and description on the jointing stage (Feekes 6). In the Rolling Plains wheat typically reaches the jointing between late-February through mid-March, depending on the variety. In the High Plains, jointing will normally occur between March 5th and March 20th depending on the year.

With the warm weather we have experienced in February there is a good chance wheat will joint early this year.

Document the current crop conditions: In order to document the current growth stage of your wheat (especially fields that have recently emerged) for insurance purposes, it might be beneficial to take pictures of the wheat fields. **However, the pictures must be properly dated by the camera. Additionally, it would be wise to include visible landmarks in the pictures to distinguish individual fields.** In order to get a good representation of the field, several pictures should be taken along with multiple dates over the next month. These pictures may prove useful for insurance purposes or possibly disaster claims in the future. For comparison, if possible, collect pictures from nearby fields that have vernalized.

Fertilizer recommendations: In those fields where yield potential is still average, a top-dress nitrogen application should be applied prior to the wheat jointing stage (Feekes 6). The later nitrogen is applied past jointing, the less increase in yield can be expected. Keep in mind that top-dressing wheat with nitrogen is not going to suddenly significantly increase the yield potential of drought stressed poorly tillered wheat. At the most a few additional tillers may form, if the wheat has not already jointed, along with the potential for a few more grain kernels in each head. In the High Plains region in particular, those wheat fields where nitrogen application may be justified, the presence of weeds is significant. Consider adding a herbicide to the top-dress nitrogen application where needed. In the Central Texas and Blacklands, most of the wheat with decent yield potential is beyond the jointing and a fertilizer application is not justified.

How much fertilizer should be applied?: Total nitrogen required for a wheat crop should be based on the yield potential. The current recommendation is a total of 1.5 lbs of nitrogen/estimated bushel of yield. So, substract any residual and early-season nitrogen from the total needed, and top-dress to meet the 1.5 lbs nitrogen/bushel. For example, if you had a 30 bu/a yield potential, then 45 lbs of nitrogen is required. If 20 lbs of nitrogen was applied at planting, then an additional 25 lbs of nitrogen is required at top-dress. However, the yield has dropped to 15 bu/a due to drought, then the 20 lbs of nitrogen applied at planting should be sufficient to meet the crop requirements.

Estimating wheat yields: Dryland wheat fields that have a good stand still have potential to produce moderate to good yields, if more rain occurs in the near future. Yield estimates for wheat that has adequate tiller counts (greater than 25-30 tillers/ ft of row on 8" drill rows) may still yield around 25 bushels/a. See the publication entitled "Estimating Wheat Yield Potential" at http://varietytesting.tamu.edu/wheat/docs/mime-6.pdf for specific details on yield potential (remember this publication will only estimate wheat yield potential and therefore, should be only be used as a guide in making cropping decisions). When estimating wheat yields one will most likely want to take a conservative approach and use the formulas developed with 15 seeds/head, (unless you are optimistic that we are going to have moderate temperatures coupled with wet conditions for several days during the flowering phase of wheat). This will especially be true for wheat that is stressed and has very little subsoil moisture. Care should also be taken to use live tillers of significant size and not ones that have already died in these estimations. Additionally, areas with low or no wheat stand should also be considered when estimating the overall field yields.

Should the wheat crop be destroyed to prepare for a summer crop?:

- Before any crop is destroyed, visit with the appropriate agencies about your wheat crop insurance and carefully plan your alternatives.
- Herbicide carryover, many of the wheat herbicides applied to wheat have a long crop rotation restriction for cotton, corn, sorghum, and soybean. In particular herbicides such as Ally, Amber, and Finesse have a long crop rotation restriction. If a herbicide was applied to the wheat crop, be sure to check the herbicide label to determine the plant back restrictions.
- If preplant nitrogen was applied in the fall, much of this nitrogen should still be present in the. This residual nitrogen present in the soil should be subtracted from the recommended nitrogen for the summer crop. Previous research in the Blacklands has identified well over 70-100 lbs N in the top two feet of the soil (McFarland and Lemon, 2005). Considering the current price of nitrogen fertilizer, it will definitely be feasible to quantify the amount of nitrogen present in the soil before applying nitrogen fertilizer for the summer crop. Producers are encouraged to take soil samples down to at least one foot, to estimate the amount of nitrogen available.
- If the decision to destroy the crop is made it will likely be best to use tillage rather than herbicides to insure a good kill of the wheat. Drought stressed wheat will not absorb and translocate herbicide very well resulting in regrowth of the wheat once rainfall does occur.