Late-Season Wheat Management Considerations

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Texas Panhandle & South Plains

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Haying of Winter Wheat

- Considerable wheat acres already being swathed and baled for hay
- Stage of growth is a factor
- What type of animal will be fed?
  - Stockers needing energy and protein vs. cows that have a lower nutrient requirement
- Selling hay? Does the buyer appreciate and is willing to pay for quality?
  - If not, then you have to sell them lbs. to make money
- Beardless vs. bearded
  - Beardless has an elevated perception as 'good hay', that is not merited. At the same stage of growth beardless and bearded have the same forage quality (and the same yields)

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Lubbock Co. Oat Trial
One-time Hay Harvest, var. Troy

Growth Stage	Harvest Date	Dry Hay Lbs./A	% Crude Protein	Lbs. CP per acre
Early Boot	May 17	3,240	18.4	596
Init. Heading	May 24	4,510	16.3	735
Fully Headed	May 31	5,465	13.9	760
Milk	June 7	6,010	12.5	751
Mealy Ripe	June 14	6,420	11.5	738
Firm Dough	June 21	6,845	8.7	596

Most producers do not fully appreciate or understand the changes (decline) in small grains forage quality with increasing maturity. This oat trial is a good proxy for wheat. The implications of this data demonstrate that the type of small grains hay and forage should be considered for the type of animal we are feeding. Don't expect stockers to gain well on headed out wheat hay—they don't get enough protein without supplementation. Conversely, cows don't need that high of quality forage so don't "waste" too much boot wheat hay on them. And hay prices should reflect this forage quality differential (but usually don't, so a grower in order to maximize income must grow tons).

The “Trap” of Beardless Wheat for Hay

- What is it?
- There is a common flaw that producers don’t recognize in hay production from beardless wheat?
- When do producers often cut beardless wheat relative to bearded wheat?
- What is the “trap”?

The "Trap" of Beardless Wheat for Hay

- What is it?
- There is a common flaw that producers don't recognize in hay production from beardless wheat.
- When do producers often cut beardless wheat relative to bearded wheat?
  - Usually at a later growth stage, headed out (which you wouldn't do with bearded wheat lest there be awns getting stuck in throats, jaws, gums, which is painful and causes the animal to go off feed, or stop eating)
- What is the "trap"?
  - Lower forage quality. Producers unwittingly are accepting lower quality forage (up to 5% or more lower than late boot stage %CP)

Typical AgriLife High Plains wheat trial: Smaller plots actually improve our ability to reduce influence of factors other than variety genetics. This type of trial is less expensive to conduct and allows more varieties at more test sites with limited funds.

e Rust in wheat, covering about 5-10% o
o from Ron French?

AgriLife "Pick" Wheat Grain Varieties—Texas High Plains (2015-2016)

(Leaf rust/stripe rust resistance: 0-Susecptible, 1-Moderately Susceptible, 2-Moderately Resistant, 3-Resistant)

Full Irrigation	Limited Irrigation	Dryland
	TAM 111 (0/0)	TAM 111
	TAM 112 (0/0)	TAM 112
TAM 113 (3/3)	TAM 113	TAM 113
TAM 304 (3/2)		
	T158 (1/2) (new)	T158 (new)
Winterhawk (1/2)	Winterhawk	Winterhawk
Iba (3/3)	Iba	Iba

Endurance deleted from Dryland for 14-15 season (popular dual-purpose choice). Hatcher & Duster deleted from all three for 15-16; TAM 111 deleted from full irrigation for 15-16

For further information consult the annual edition of "20XX Wheat Variety Trials Conducted in the Texas and New Mexico High Plains," (Trostle, Rudd, others).

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Observations Week of April 11, 2016

Texas South Plains

- Quick burst of stripe rust in Dawson Co.
- Fungicides already sprayed in some fields
- Wet humid weather predicted April 14-17 did not materialize, but conditions appear favorable for further development April 19-21.
- **Flag leaf** stripe rust ratings, Lamesa, TX (% coverage, April 13, 2016)
  - TAM 111, 70%
  - TAM 112, 40%
  - TAM 113, 30% (yellow, but no pustules; see comments next slide)
  - TAM 401, 2%
  - SY Monument, 0% (very clean)

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Flag Leaf & Stripe Rust 1

- It is important to protect the flag leaf from disease as it contributes 70-75% of the photosynthate for grain development
- Economic thresholds in the past have suggested that yield potential might need to be in the 40 bu./A range to justify spraying, but the degree of potential losses in a susceptible variety, at a good wheat price, and inexpensive “zole’ fungicides (tebucanazole, propicanazole, etc.; chemical costs ~$3/acre) might merit spraying lower yield potential fields.

Flag Leaf & Stripe Rust 2

Regarding yellowing of flag leaves in Resistant TAM 113

- Comments via E-mail, wheat breeder Dr. Jackie Rudd, Amarillo, April 14, 2016
- “Your Dawson observations are correct. The stripes without pustules is the reaction we are seeing on TAM 113 at multiple locations. It is a resistant reaction, similar to ‘flecking’ we see with leaf rust sometimes. It will not likely get pustules. Regarding TAM 111 and TAM 112, they are completely susceptible to our current races. Varieties that you mentioned as clean, will likely remain clean until we get another race change sometime in the future (hopefully still a few years out). The resistant reaction that TAM 113 is showing does cause some leaf area loss, but much less than susceptible reaction. From what we have seen even resistant cultivars show a yield bump with timely fungicide applications.
- “Some of the clean lines to the current stripe rust races, which are also good performers in the southern High Plains, are TAM 204 (beardless), TAM 114, TAM 401, Gallagher, Grainfield, and Monument. As I said earlier, TAM 113 reaction is much better than susceptible but the stripes do cause some yield reduction.


Dawson Co., April 13, 2016
Stripe rust infection of flag leaves especially evident in TAM 111
TAM 111
TAM 112
TAM 113

Dawson Co., April 13, 2016

Border area of TAM 113 along AgriLife variety trial next to the farmer's field variety (TAM 111)

•Count total number of fully expanded green leaves and those that have any level of stripe rust.
•Stripe rust will cover one percent (1%) of leaf area when 30-40 leaves are infected per 100 green leaves.

Potential Loss of Yield (%) from Stripe Rust based on Growth Stage of Wheat and Host Susceptibility. **Z**=Zadoks Decimal Growth Scale **F**=Feekes Growth Stage

Start of Epidemic (Epiphytotic)	Percentage Loss in Crop based on Host Susceptibility			
	S(2)	MS(4)	MR(6)	R(8)
First Node (Z31; F6)	85	75	55	25
Flag leaf (Z39; F9)	75	45	15	5
Mid-boot (Z45; F10)	65	25	7	2
First awns visible; First Spikelet of Inflorescence Barely Visible (Z49; between F10-10.1)	50	10	3	1
Mid-heading, half of inflorescence emerged (Z55; F10.3)	40	5	2	0
Mid-flowering; Anthesis half way (Z65; 10.52)	12	2	1	0

S=Susceptible **MS**=Moderately Susceptible **MR**= Moderately Resistant **R**=Resistant

From http://amarillo.tamu.edu/files/2010/11/StripeRustLossFShRdF.pdf

From **"Stripe Rust on Wheat: Scouting, Spraying and Potential Yield Losses,"** PLPA-Wh010-02 (Dr. Ron French, Texas A&M AgriLife Extension plant pathology, Amarillo)

Heavy stripe rust pustule development on flag leaf of susceptible TAM 111 (Dawson Co., April 13, 2016)

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Yellowing of flag leaf from strip rust infection on susceptible TAM 112, with initial pustule development (Dawson Co., April 13, 2016)

Degree of stripe rust pustule development on flag leaf of resistant TAM 113 (Dawson Co., April 13, 2016)

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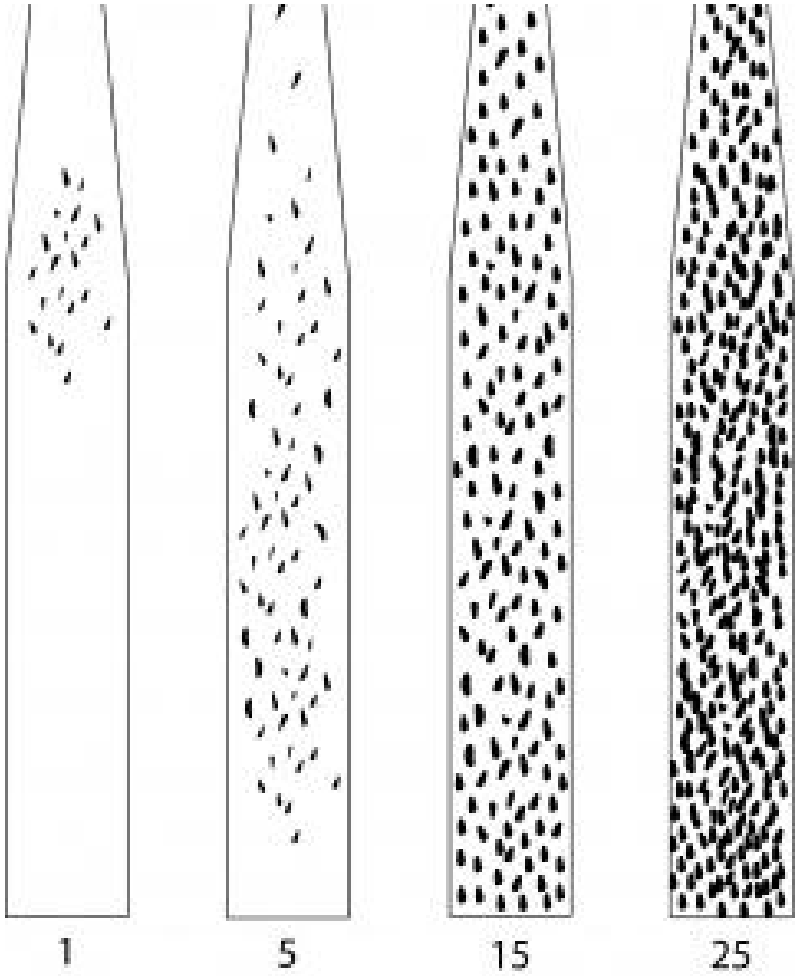
Leaf Rust Coverage %

Actual coverage is often less than it appears as we focus our attention on the infection.



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View, print, or download color copies at
http://lubbock.tamu.edu/files/2011/10/wheatgrowthstages_26.pdf

SCS-1999-16

Growth Stages of Wheat:
Identification and Understanding Improve Crop Management

Texas Agricultural Extension Service
The Texas A&M University System

By Travis D. Miller

Understanding growth stages of wheat is important in matching management decisions and inputs with plant development. This article outlines characteristics and management decisions that may be associated with indicated stages of plant growth

There are at least five scales commonly used worldwide to describe stages of growth of wheat and other small grains. The scale used is not important, as long as the grower has a thorough understanding of the growth habit

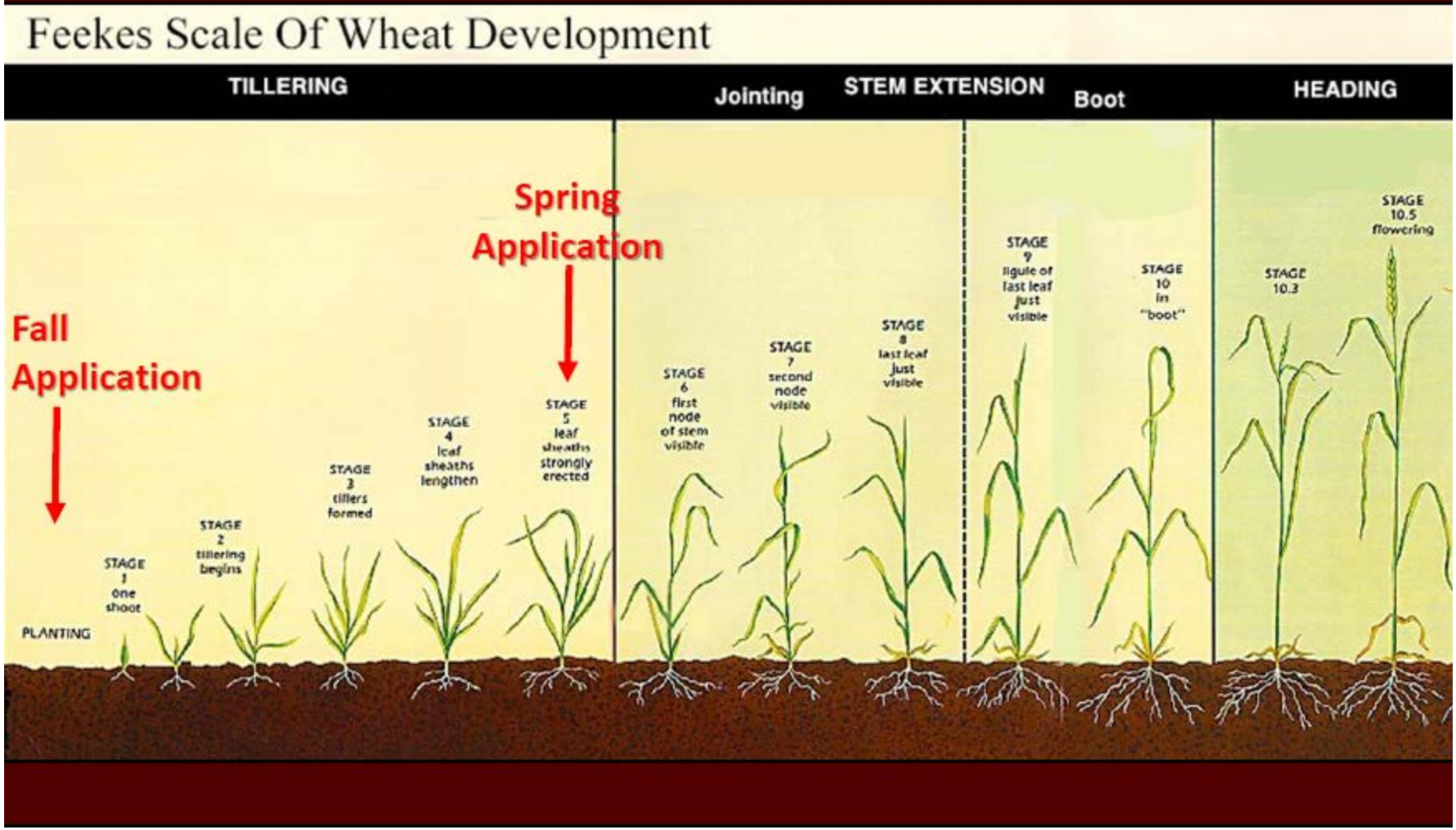
Feekes 1.0 — Emergence, on shoot formed

If desired, number of leaves present on the first shoot can be designated with a decimal. For example, 1.3 is a single shoot with three leaves unfolded. With-

Tillers share the same root mass with the original shoot or main stem. Once established, secondary tillers may arise from the axils of the primary tillers; tertiary tillers may develop from the axils of secondary tillers, etc.

During tillering, the major management consideration is whether stands are adequate to achieve yield goals. Manage-

Right Time



Courtesy Dr. Clark Neely

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Late Season Irrigation 1

- Water use on warm, dry days can readily exceed 0.25”
- Wheat, as a cool-season grass, is less water-use efficient than our summer crops
  - An incremental inch of irrigation on wheat in the Texas High Plains is worth about 3 to 4 bu/A of grain yield
  - Timely applications in late boot to flowering could be worth up to 7 bu/A

Late Season Irrigation 2

- If soil moisture is fairly good, then no further irrigation once soft dough is reached. Let the wheat use the last of the water.
  - Producers are sometimes uncomfortable with this, so you may irrigate one more time; late irrigation could help some smaller tillers fill grain
- Irrigation prior to soft dough depends on producer's irrigation capacity, goals, cost of irrigation, etc.

Harvest Wheat Grain Moisture Content

- When you sell grain near the standard moisture content (for wheat that is 13.5%), you can “sell water” and get paid for it.
  - Wheat above 13.5% moisture will be docked (adjusted for higher moisture), but you do not get “paid” for dry grain, e.g., buyers do not adjust your lbs. of grain up to standard moisture
  - {In AgriLife grain trials for wheat, corn, grain sorghum, sunflower, etc. the plot yield samples are tested for moisture, and then all variety/hybrid and treatment yields are reported at standard moisture.}
- So harvesting dry grain—when you could have done it sooner—means you don’t sell water, and in reduces your potential income?
- But by how much?

Harvest Wheat Grain Moisture Content

- The accompanying calculation a wheat price of $4.50/bu, and calculates the “$Loss” per 10-bushel units, and also what that loss would be for a 50-bu/A wheat crop (as well as 500 acres of this crop).

- You can use the “per unit” (10 bushels) in discussion. Another way to look at this is that at $4.50/bu, you lose about $0.05 value per bushel per **each** 1% reduced wheat grain moisture content below 13.5%.

- An accompanying Excel file has a more accurate calculation, and it will be refined for further use.

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$ "Losses" from Harvest at Low Moisture

Wheat ($/bu.)	Bushel Unit	Harvest H2O	Bu. to achieve same Yld.	Return per 10 bu/A	Per Acre "loss"	At 50 bu/A 500 acres "loss"
4.50	10	0.135	10.00	$ 45.00		
4.50	10	0.115	10.23	$ 46.04	$1.04	$ 2,601
4.50	10	0.135	10.00	$ 45.00		
4.50	10	0.095	10.52	$ 47.35	$2.35	$ 5,887
4.50	10	0.135	10.00	$ 45.00		
4.50	10	0.075	10.76	$ 48.40	$3.40	$ 8,503

This initial information has been improved using an Excel file (contact Calvin Trostle).

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