INSTITUTE OF AGRICULTURE
THE UNIVERSITY OF TENNESSEE

Managing Wheat for Top Yields and Grain Quality

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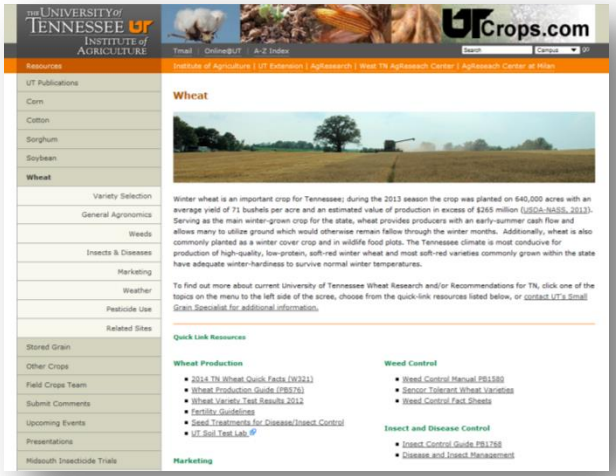
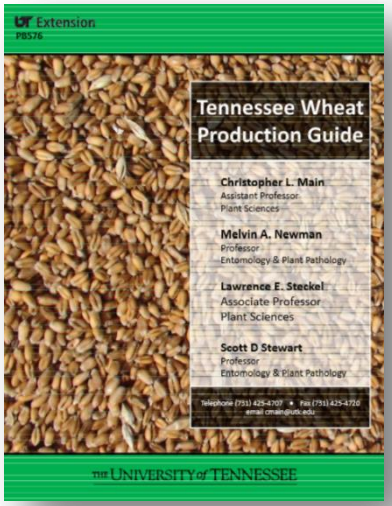
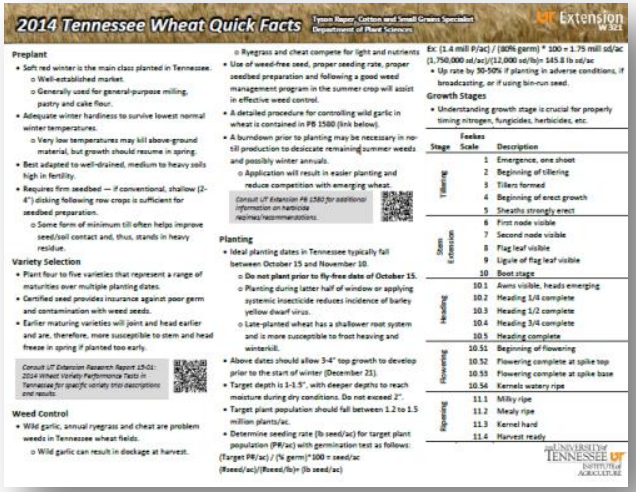
Additional Materials



[UTcrops.com]

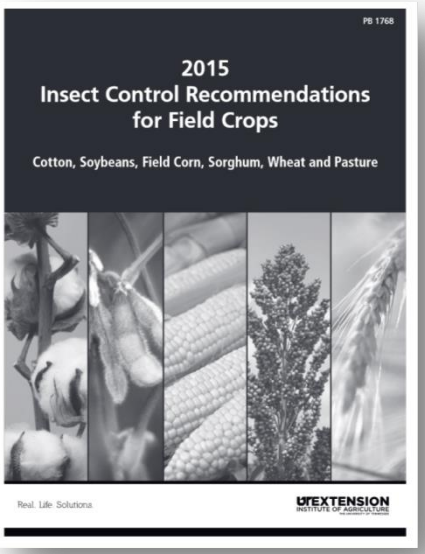


[TN Wheat Production Guide]



[2014 TN Wheat Quick Facts]

[TN Wheat Disease Identification]

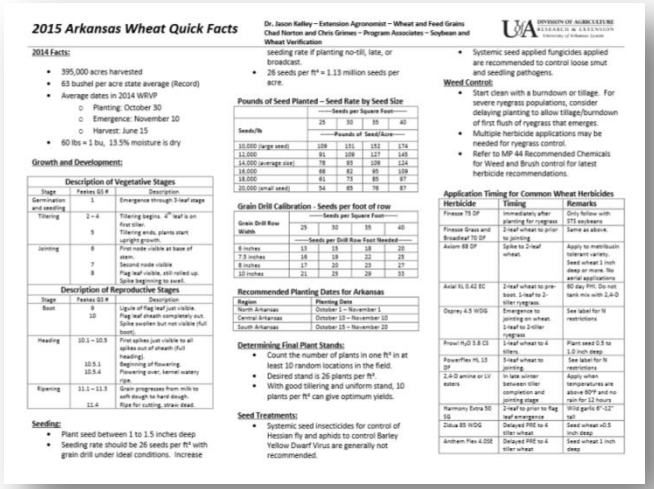


[2015 Insect Control Recommendations]

[2015 Weed Control Manual]

Outline

- Seedbed Preparation
- Planting
- Growth stages
  - Tillering
  - Jointing
- Mid-season management
  - Nitrogen
  - Insecticides
  - Fungicides
- 2014 TN Wheat Quick Facts



2015 Arkansas Wheat Quick Facts

Dr. Jason Kelley – Extension Agronomist – Wheat and Feed Grains
Chad Norton and Chris Grimes – Program Associates – Soybean and Wheat Verification

UA DIVISION OF AGRICULTURE RESEARCH & EXTENSION

2014 Facts:

- 395,000 acres harvested
- 63 bushel per acre state average (Record)
- Average dates in 2014 WRVP
  - Planting: October 30
  - Emergence: November 10
  - Harvest: June 15
- 60 lbs = 1 bu, 13.5% moisture is dry

Growth and Development:

Description of Vegetative Stages

Stage	Feekes GS #	Description
Germination and seedling	1	Emergence through 3-leaf stage
Tillering	2 – 4	Tillering begins. 4th leaf is on first tiller.
	5	Tillering ends, plants start upright growth.
Jointing	6	First node visible at base of stem.
	7	Second node visible
	8	Flag leaf visible, still rolled up. Spike beginning to swell.

Description of Reproductive Stages

Stage	Feekes GS #	Description
Boot	9	Ligule of flag leaf just visible.
	10	Flag leaf sheath completely out. Spike swollen but not visible (full boot).
Heading	10.1 – 10.5	First spikes just visible to all spikes out of sheath (full heading).
	10.5.1	Beginning of flowering.
	10.5.4	Flowering over, kernel watery ripe.
Ripening	11.1 – 11.3	Grain progresses from milk to soft dough to hard dough.
	11.4	Ripe for cutting, straw dead.

Seeding:

- Plant seed between 1 to 1.5 inches deep
- Seeding rate should be 26 seeds per ft² with grain drill under ideal conditions. Increase seeding rate if planting no-till, late, or broadcast.
- 26 seeds per ft² = 1.13 million seeds per acre.

Pounds of Seed Planted – Seed Rate by Seed Size

	Seeds per Square Foot			
Seeds/lb	25	30	35	40
	Pounds of Seed/Acre			
10,000 (large seed)	109	131	152	174
12,000	91	109	127	145
14,000 (average size)	78	93	109	124
16,000	68	82	95	109
18,000	61	73	85	97
20,000 (small seed)	54	65	76	87

Grain Drill Calibration - Seeds per foot of row

Grain Drill Row Width	Seeds per Square Foot			
	25	30	35	40
	Seeds per Drill Row Foot Needed			
6 inches	13	15	18	20
7.5 inches	16	19	22	25
8 inches	17	20	23	27
10 inches	21	25	29	33

Recommended Planting Dates for Arkansas

Region	Planting Date
North Arkansas	October 1 – November 1
Central Arkansas	October 10 – November 10
South Arkansas	October 15 – November 20

Determining Final Plant Stands:

- Count the number of plants in one ft² in at least 10 random locations in the field.
- Desired stand is 26 plants per ft².
- With good tillering and uniform stand, 10 plants per ft² can give optimum yields.

Seed Treatments:

- Systemic seed insecticides for control of Hessian fly and aphids to control Barley Yellow Dwarf Virus are generally not recommended.
- Systemic seed applied fungicides applied are recommended to control loose smut and seedling pathogens.

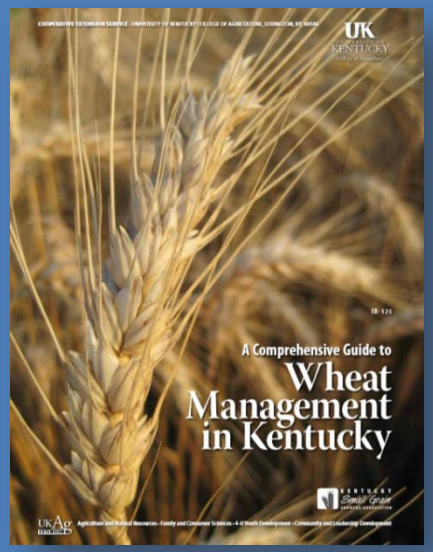
Weed Control:

- Start clean with a burndown or tillage. For severe ryegrass populations, consider delaying planting to allow tillage/burndown of first flush of ryegrass that emerges.
- Multiple herbicide applications may be needed for ryegrass control.
- Refer to MP 44 Recommended Chemicals for Weed and Brush control for latest herbicide recommendations.

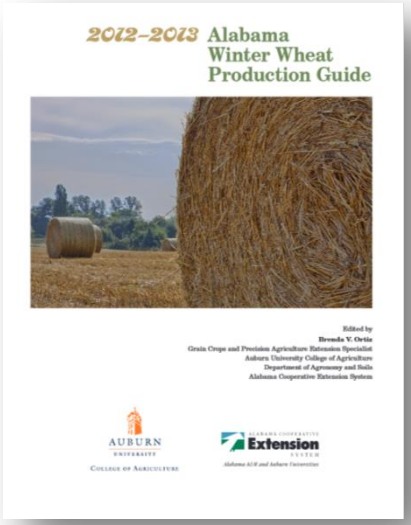
Application Timing for Common Wheat Herbicides

Herbicide	Timing	Remarks
Finesse 75 DF	Immediately after planting for ryegrass	Only follow with STS soybeans
Finesse Grass and Broadleaf 70 DF	2-leaf wheat to prior to jointing	Same as above.
Axiom 68 DF	Spike to 2-leaf wheat.	Apply to metribuzin tolerant variety. Seed wheat 1 inch deep or more. No aerial applications
Axial XL 0.42 EC	2-leaf wheat to pre-boot. 1-leaf to 2-tiller ryegrass.	60 day PHI. Do not tank mix with 2,4-D
Osprey 4.5 WDG	Emergence to jointing on wheat. 1-leaf to 2-tiller ryegrass	See label for N restrictions
Prowl H2O 3.8 CS	1-leaf wheat to 4 tillers.	Plant seed 0.5 to 1.0 inch deep
PowerFlex HL 13 DF	3-leaf wheat to jointing.	See label for N restrictions
2,4-D amine or LV esters	In late winter between tiller completion and jointing stage.	Apply when temperatures are above 60°F and no rain for 12 hours
Harmony Extra 50 SG	2-leaf to prior to flag leaf emergence.	Wild garlic 6"-12" tall
Zidua 85 WDG	Delayed PRE to 4 tiller wheat	Seed wheat >0.5 inch deep
Anthem Flex 4.05E	Delayed PRE to 4 tiller wheat	Seed wheat 1 inch deep

2015 AR Wheat Quick Facts



Wheat Management in KY



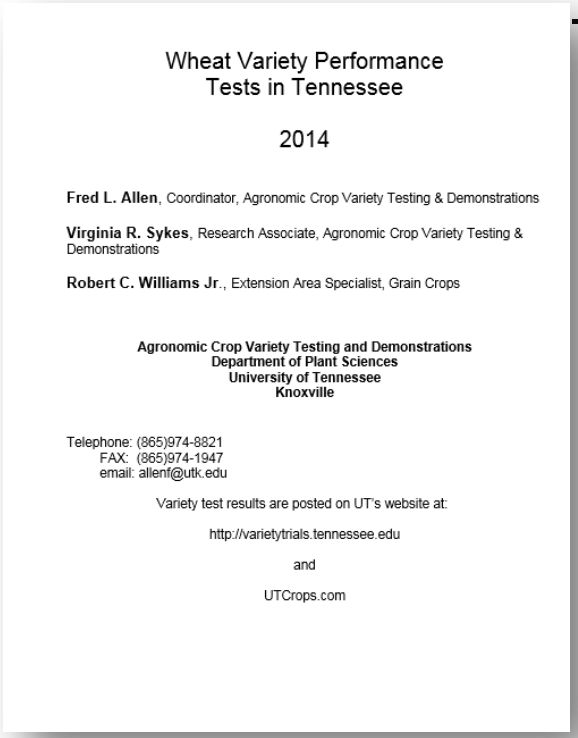
AL Winter Wheat Production Guide

Seedbed Preparation

- Prior crop harvest (very important if in a no-till system)
  - Chop and spread residue evenly behind the combine to the width of the header
    - A 'windrow'-like concentration of the residue behind the combine is difficult to manage
      - Variability will exist in moisture under residue versus 'bare' soil
      - Subsequent issues with trafficability and consistency in seedbed
      - Difficulty placing seed at a consistent depth across planter
    - Even residue spread?
      - More consistent seedbed
        - » Uniform moisture content across planter width
        - » Easier planter set-up, more consistent depth placement of the seed and therefore more uniform stands
    - Very important for maintaining high yield potential
- Seedbed
  - Firm, weed-free, preferably well-drained
  - No-till
    - No-till is an excellent option on many TN acres
      - Less fuel, labor; very similar yields
    - If weeds are present, a burn-down herbicide should be applied
  - Conventional tillage
    - Disking at 2-4" typically sufficient
    - Conduct tillage early enough for seedbed to settle and firm-up
  - Wheat prefers well-drained soils
    - Water requirements for wheat are quite a bit lower than the seasonal rainfall received in TN

Planting

- Variety Selection
  - Arguably, one of the most important decisions made each year
  - Select high yielding, STABLE, disease resistant, adapted varieties
    - It is almost always a good idea to plant more than one variety!
      - Seasonal characteristics generally favor a given variety over others
      - Planting multiple varieties buffers you from potential loss associated with selecting only one variety
    - The University of Tennessee conducts variety trials throughout the state on 85+ varieties yearly
      - Resist the temptation to select varieties based on one site-year
        - » The highest yielding variety from a given site-year may not be a consistent performer
        - » 'Stability' is critical and should be considered.
      - Best selection method? Examine state averages and then move to location results.



Wheat Variety Performance
Tests in Tennessee

2014

Fred L. Allen, Coordinator, Agronomic Crop Variety Testing & Demonstrations

Virginia R. Sykes, Research Associate, Agronomic Crop Variety Testing & Demonstrations

Robert C. Williams Jr., Extension Area Specialist, Grain Crops

Agronomic Crop Variety Testing and Demonstrations
Department of Plant Sciences
University of Tennessee
Knoxville

Telephone: (865)974-8821
FAX: (865)974-1947
email: allenf@utk.edu

Variety test results are posted on UT's website at:

http://varietytrials.tennessee.edu

and

UTCrops.com

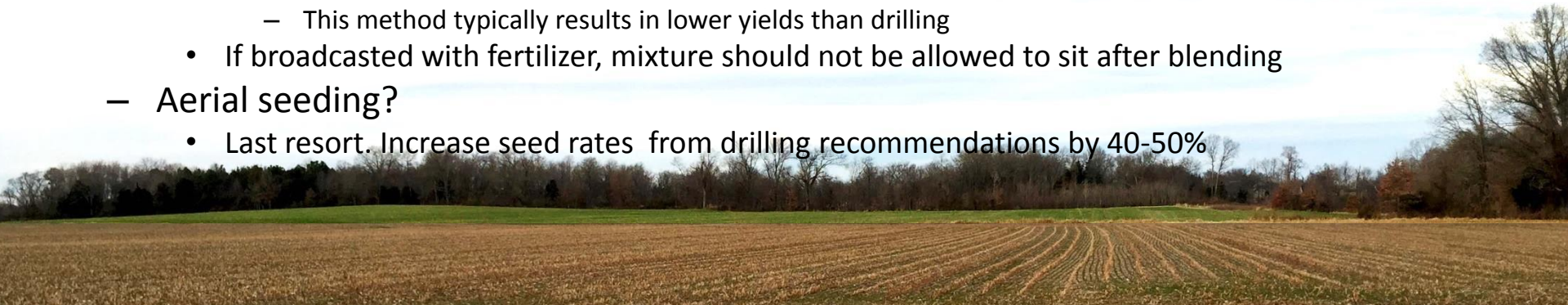
varietytrials.tennessee.edu

Planting

- Planting Date
  - TN- between October 15 and November 10
    - Goal is to have a well-rooted plant with 3-4” top growth before December 21 (first day of winter)
    - Should attempt to find the ‘sweet spot’ between early and late planting
      - early planting
        - » promotes sufficient growth to survive winter
          - Less prone to heaving
          - Established plant can survive lower temperatures
        - » too early?
          - Excessive fall growth
          - Greater chance of spring freeze injury (earlier head emergence)
      - late planting
        - » suppresses some insect and disease infestations
          - Aphid/Barley yellow dwarf virus complex
          - Reduce Hessian fly issues
        - » too late?
          - Insufficient growth to survive winter (issues mentioned above)
          - Push maturity back
          - Potentially reduce yields
- Planting depth
  - 1-1.5 inches
    - Places seminal roots at an ideal depth to support seedling development without overly-stressing the developing seedling’s coleoptile

Planting

- Planting Method
  - Function of equipment availability, labor, field trafficability (season), and crop use
  - Target stand is near 25 plants per square ft
  - From an agronomic standpoint, drilling is preferred
    - As a monocot, seminal roots form at the depth of the seed
      - Very important to seedling establishment
        - » Too shallow? Many concerns!
    - Drilling allows for the placement of the seed (&seminal root system) at the ideal depth and spacing
    - Supports rapid, uniform stand establishment
      - Requires less seed to reach target plant population
      - Generally results in higher yields than broadcast/incorporated
    - Utilizing a no-till drill in the no-till system allows for prolonged erosion control without sacrificing consistent stands and high yields
    - Drilling? Target 1.5 to 2 bushels per acre (1.2 to 1.5 million plants per acre)
  - Broadcast/incorporated is typically a faster method
    - Seeding rate should be increased to between 2-3 bushels (increase the drilled rate by 30-35%)
      - This is to compensate fore uneven seed placement which can result in less-than-ideal soil/seed contact, increased potential for animal predation, reduced germination/emergence and susceptibility to frost heaving of seeds.
      - This method typically results in lower yields than drilling
    - If broadcasted with fertilizer, mixture should not be allowed to sit after blending
  - Aerial seeding?
    - Last resort. Increase seed rates from drilling recommendations by 40-50%



Growth Stage

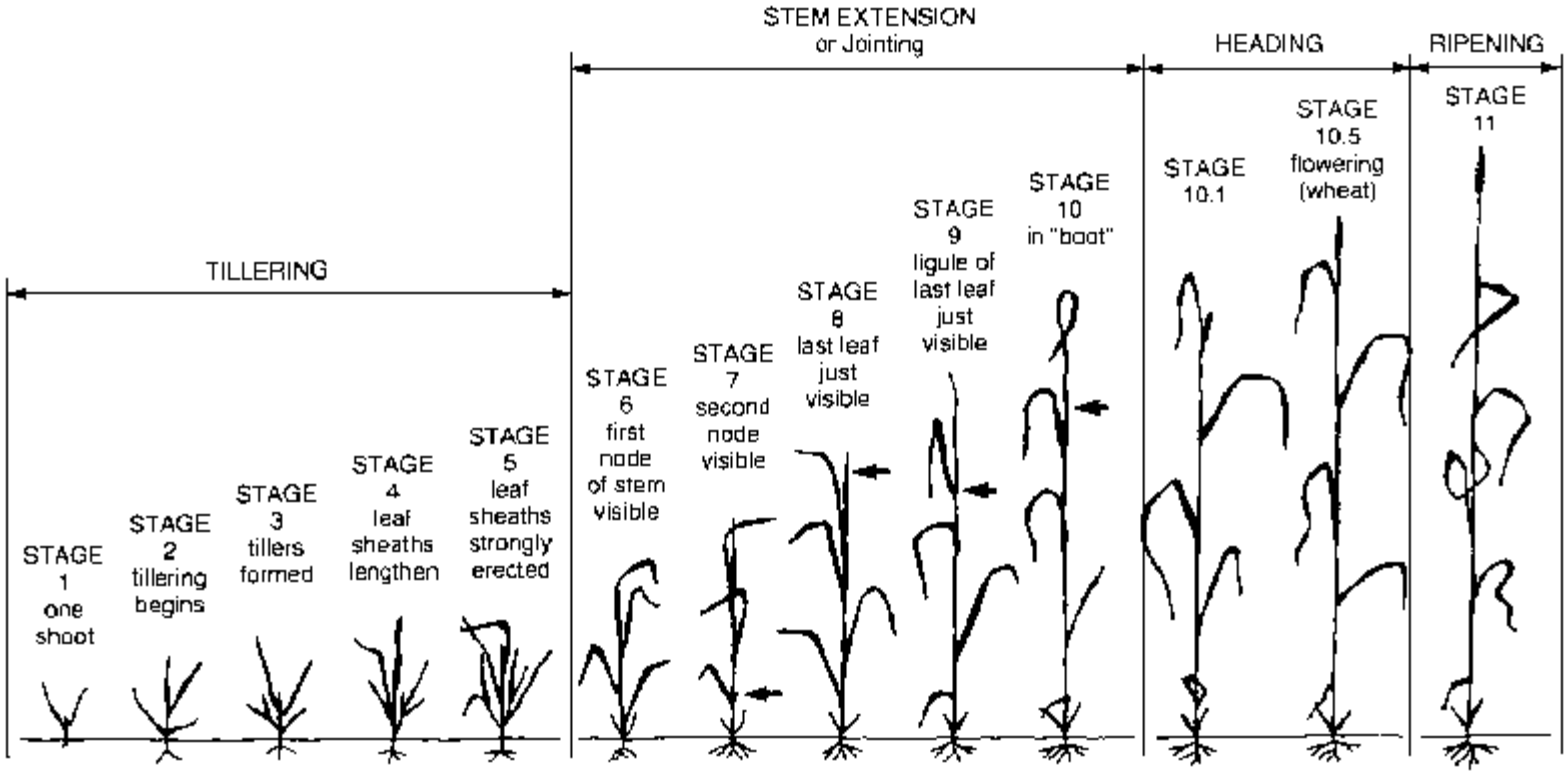
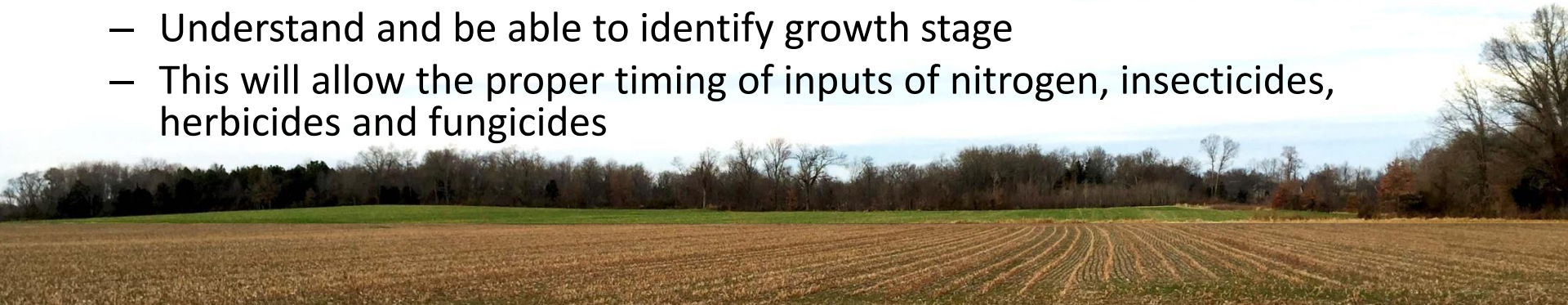


Image courtesy North Carolina State University; http://ipm.ncsu.edu/grain/smgrain521.html

- First step for in-season management for high quality/yield?
  - Understand and be able to identify growth stage
  - This will allow the proper timing of inputs of nitrogen, insecticides, herbicides and fungicides



Identification of Tillers

- ‘Tillering’ usually begins after three or four leaves have developed.
  - Primary tillers form in the axils of true leaves at the base of the main stem of the plant
  - Secondary tillers may develop from base of primary tillers
  - A coleoptilar tiller may form, but occurs sporadically and is influenced by many parameters
- Base of each tiller is a prophyll
  - Modified leaf which guides/protects developing tiller
  - Similar in function to the coleoptile
  - Identification can help in distinguishing developing tillers from main stem leaves

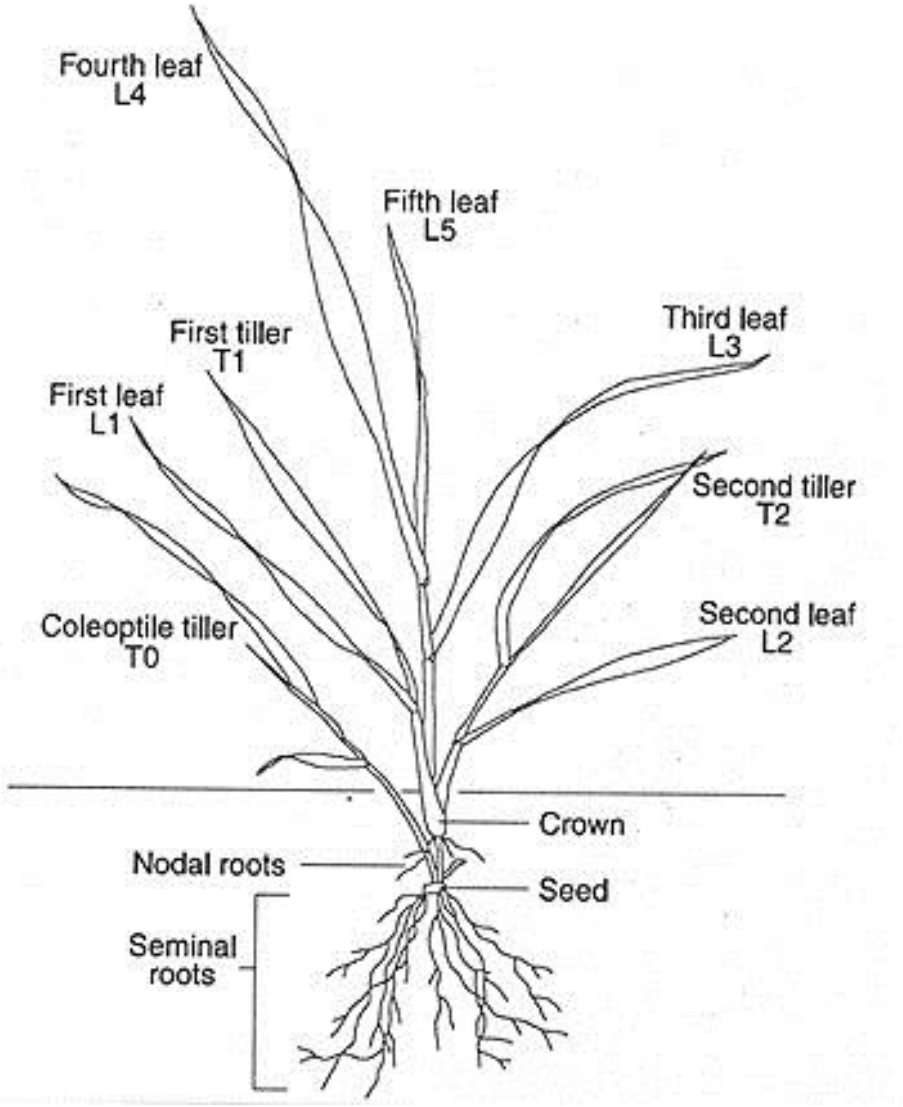
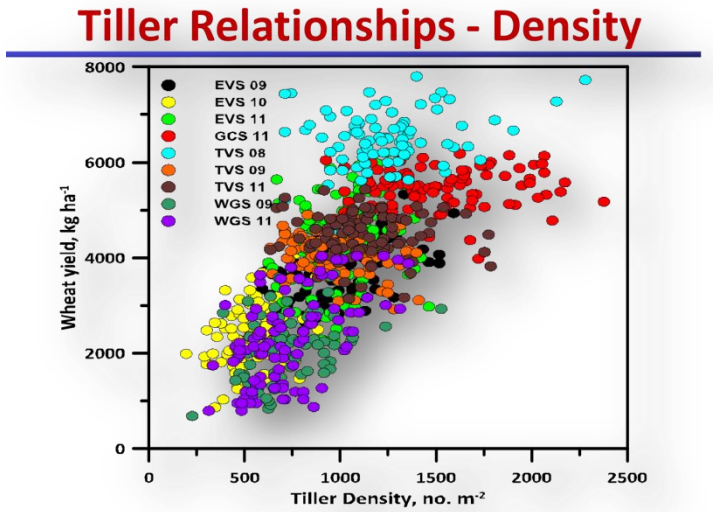


Image courtesy North Dakota State University;
http://www.ag.ndsu.edu/archive/entomology/ndsucpr/Years/2006/may/25/psci2.jpg

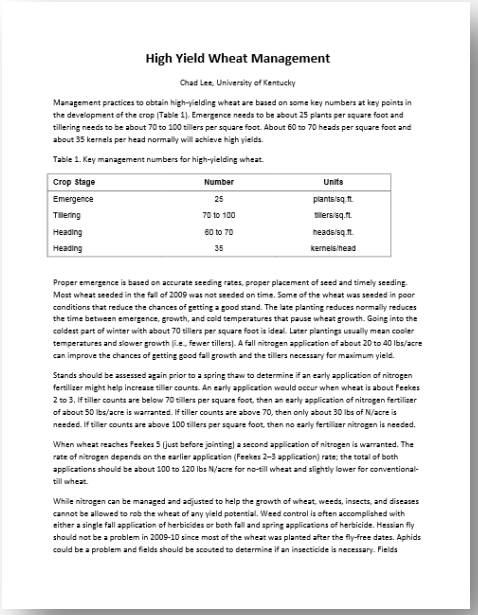
Tiller number and Yield

- Tiller number and wheat yield generally correlate very well to each other.
  - This is because tiller number frequently relates very strongly to head number (which in turn relates to wheat yield!)
- Number of tillers per foot (including mainstem) counted in late winter/early spring can be used to fine-tune nitrogen applications
  - Less than 70 tillers/ft at Feekes 3?
    - An additional 20 lb N added to the standard application near greenup can promote tillering and protect yield potential
      - Total of 50 lb N at greenup
  - Between 70 & 100 tillers/ ft at Feekes 3?
    - 30 lb N at green-up
  - In excess of 100 tillers per ft?
    - no green-up fertilizer N needed



Data courtesy Dr. Kip Balkcom, Research Agronomist for the USDA-ARS in Auburn, AL

Recommendations from, "High Yield Wheat Management" by Dr. Chad Lee, University of Kentucky



High Yield Wheat Management

Chad Lee, University of Kentucky

Management practices to obtain high-yielding wheat are based on some key numbers at key points in the development of the crop (Table 1). Emergence needs to be about 25 plants per square foot and tillering needs to be about 70 to 100 tillers per square foot. About 60 to 70 heads per square foot and about 35 kernels per head normally will achieve high yields.

Table 1. Key management numbers for high-yielding wheat.

Crop Stage	Number	Units
Emergence	25	plants/sq.ft.
Tillering	70 to 100	tillers/sq.ft.
Heading	60 to 70	heads/sq.ft.
Heading	35	kernels/head

Proper emergence is based on accurate seeding rates, proper placement of seed and timely seeding. Most wheat seeded in the fall of 2009 was not seeded on time. Some of the wheat was seeded in poor conditions that reduce the chances of getting a good stand. The late planting reduces normally reduces the time between emergence, growth, and cold temperatures that pause wheat growth. Going into the coldest part of winter with about 70 tillers per square foot is ideal. Later plantings usually mean cooler temperatures and slower growth (i.e., fewer tillers). A fall nitrogen application of about 20 to 40 lbs/acre can improve the chances of getting good fall growth and the tillers necessary for maximum yield.

Stands should be assessed again prior to a spring thaw to determine if an early application of nitrogen fertilizer might help increase tiller counts. An early application would occur when wheat is about Feekes 2 to 3. If tiller counts are below 70 tillers per square foot, then an early application of nitrogen fertilizer of about 50 lbs/acre is warranted. If tiller counts are above 70, then only about 30 lbs of N/acre is needed. If tiller counts are above 100 tillers per square foot, then no early fertilizer nitrogen is needed.

When wheat reaches Feekes 5 (just before jointing) a second application of nitrogen is warranted. The rate of nitrogen depends on the earlier application (Feekes 2–3 application) rate; the total of both applications should be about 100 to 120 lbs N/acre for no-till wheat and slightly lower for conventional-till wheat.

While nitrogen can be managed and adjusted to help the growth of wheat, weeds, insects, and diseases cannot be allowed to rob the wheat of any yield potential. Weed control is often accomplished with either a single fall application of herbicides or both fall and spring applications of herbicide. Hessian fly should not be a problem in 2009-10 since most of the wheat was planted after the fly-free dates. Aphids could be a problem and fields should be scouted to determine if an insecticide is necessary. Fields

Jointing Stage

- 'Jointing' and the beginning of the hollow-stem stage
  - Many growth-regulator herbicides cannot be applied after the jointing stage
  - After this growth stage, trafficking the field can decrease yields (wheels break stems)
  - Ideally, all N should be on prior to this stage (Feekes 6)
  - Similarly, for those managing dual-purpose wheat (grazing and harvesting grain) this is the stage grazing should be stopped
  - Best way to determine when this stage has begun?
    - Dig up wheat plant and identify main-stem
    - Feel for swollen bump on base of shoot (node)
    - Slice stem near crown and split stem (vertically up the stem)
    - Look at space between developing head and crown roots
      - ¼- ¾"? Hollow stem/jointing stage
  - Typically, no more yield-impacting tillers will develop after this stage
  - Maximum kernel number per head is determined at this stage

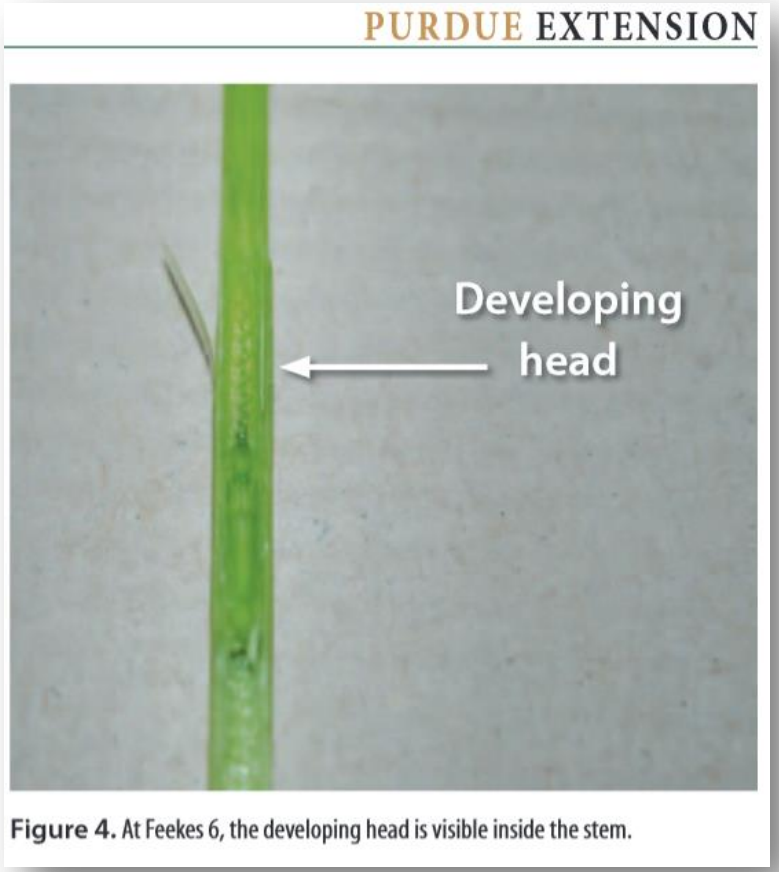
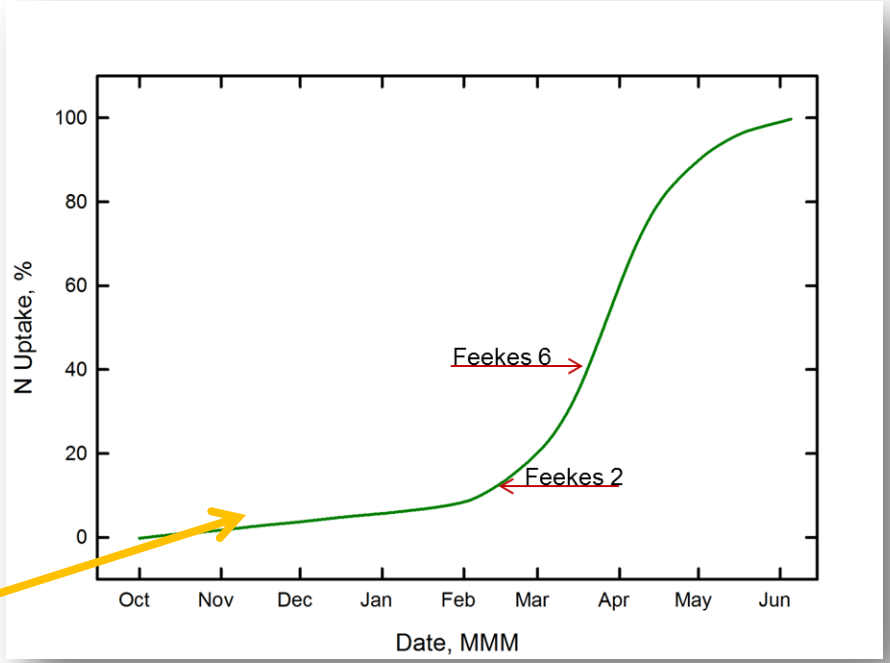


Figure 4. At Feekes 6, the developing head is visible inside the stem.

Image courtesy Purdue Extension;
https://www.extension.purdue.edu/extmedia/ID/ID-422.pdf

Wheat N Considerations

- N uptake is very low for wheat in TN until after green-up
  - We typically see demand begin to increase by February 15th
    - Still low (relatively speaking) at this date
    - Usually between Feekes 2-3 at this date
    - Although demand is low, N applications in early February can increase tiller number (it is important this small N demand can be met!)
- N uptake has begun to increase exponentially by the jointing stage
  - Typically occurs after March 15th in TN
- Ideally application in time for movement into root zone and uptake
- Large applications in early January? Early February?
  - Far from peak demand
  - Increase potential for N loss
- Most states recommend little to no fall N
- TN recommends 15-30 lb N depending upon prior crop and planting date
  - Why? Little demand early!
- With that said, 2014 was an exceptionally wet year and many observed higher-than-expected yields
  - It is logical that many fields have less available N than they would in a more-normal crop year



2015 Wheat N Considerations

- **For acres which did not receive fall N and did not follow beans-**
  - Preferred method is to wait until 'greenup' is about to occur and then assess tiller number. If necessary, then apply the first SPLIT of your target spring rate
    - A split will:
      - Support tillering at 'greenup'- thereby protecting yield potential
      - Reduce financial risks of applying entire spring application so early
        - » Minimize potential for N loss
      - Reduce negative physiological impacts of large N applications in late winter
        - » Large N applications in late winter can increase disease, burn, potential for streaking, encourage early heading and therefore potential for freeze damage
      - Allow adjustments to both timing and amount of the later-half of the split based on season

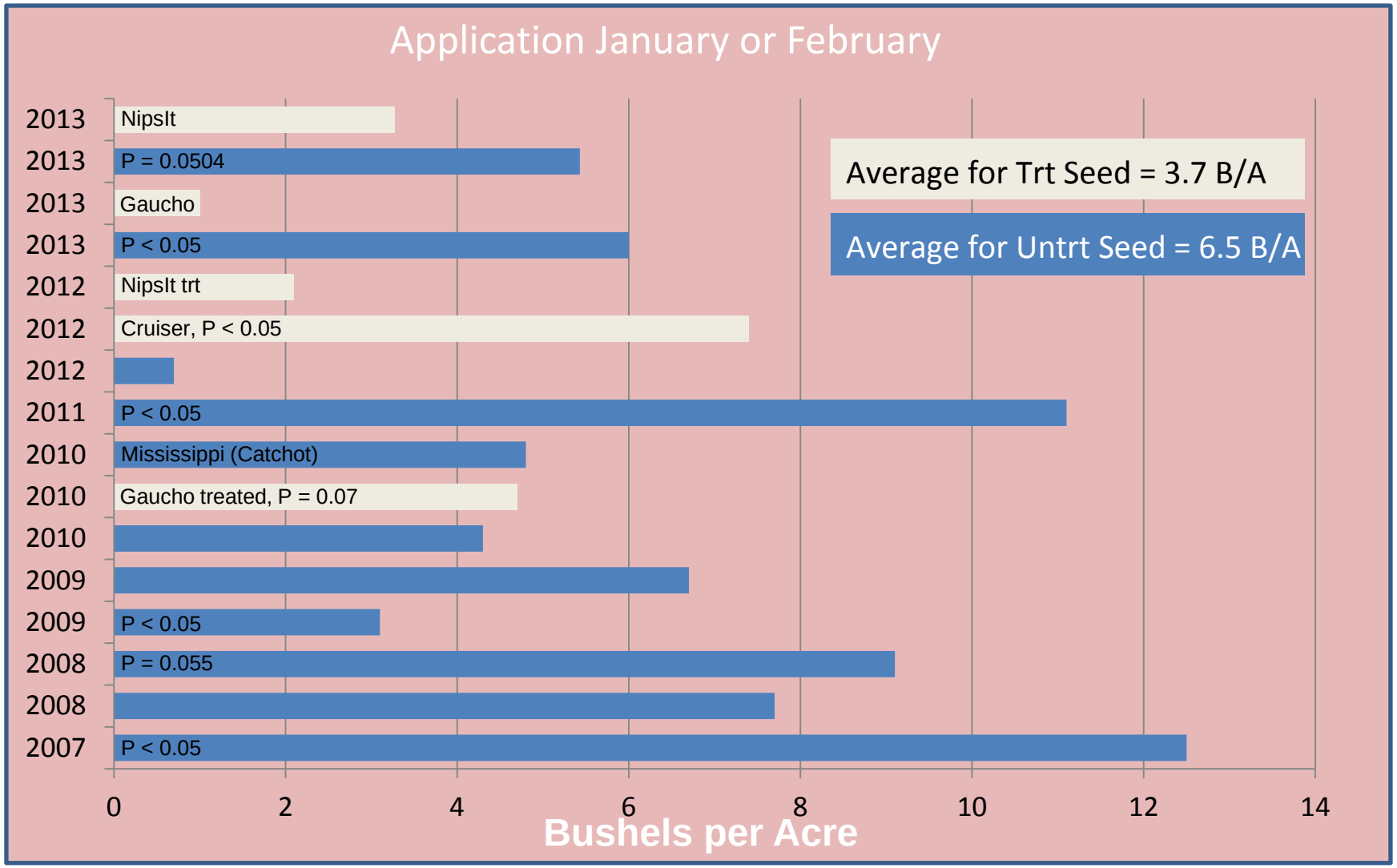
- **For acres which received fall N or are following beans**
  - Again, assess tiller number
  - Benefits of split still apply (although many are slightly reduced)
  - If applying in a single-shot, target Feekes 4-5

Barley Yellow Dwarf

- Bird Cherry-Oat Aphid
  - Dark green in color
  - Most commonly responsible for transmission of BYDV
  - No thresholds established in TN, but early planted wheat is most susceptible
    - If planting early, insecticide seed treatments such as Gaucho, Cruiser, and NipsIt Inside can reduce transmission of BYDV
    - If no seed treatments are used, foliar applications during fall (within 30 days of planting) or late winter (prior to March) can reduce transmission
      - Trigger application during this period prior to populations exceeding eight aphids per foot of row (purpose of application to prevent the spread of BYDV)

Yield Response of Wheat to Late Winter Foliar Insecticide

2007 - 2013 Planting Dates (untreated seed unless indicated)



Growth Regulators

- Lodging can be a major issue in high-yield environments where large applications of N have been applied
- Agitated by high winds and/or excessive rainfall
  - Lodging can:
    - Slow harvest
    - Result in wheat yield loss in excess of 40%
    - Cause difficulty in planting the following crop
      - Standing residue easier to plant into
      - Combine head must run very close to ground
        - » Increases residue which header takes in
        - » Increases residue laying flat on the ground
          - Subsequent consistency issues in surface residue

Image courtesy Louisiana State University AgCenter; http://louisianacrops.com/wp-content/uploads/2014/06/Wheat-lodging.jpg

Growth Regulators

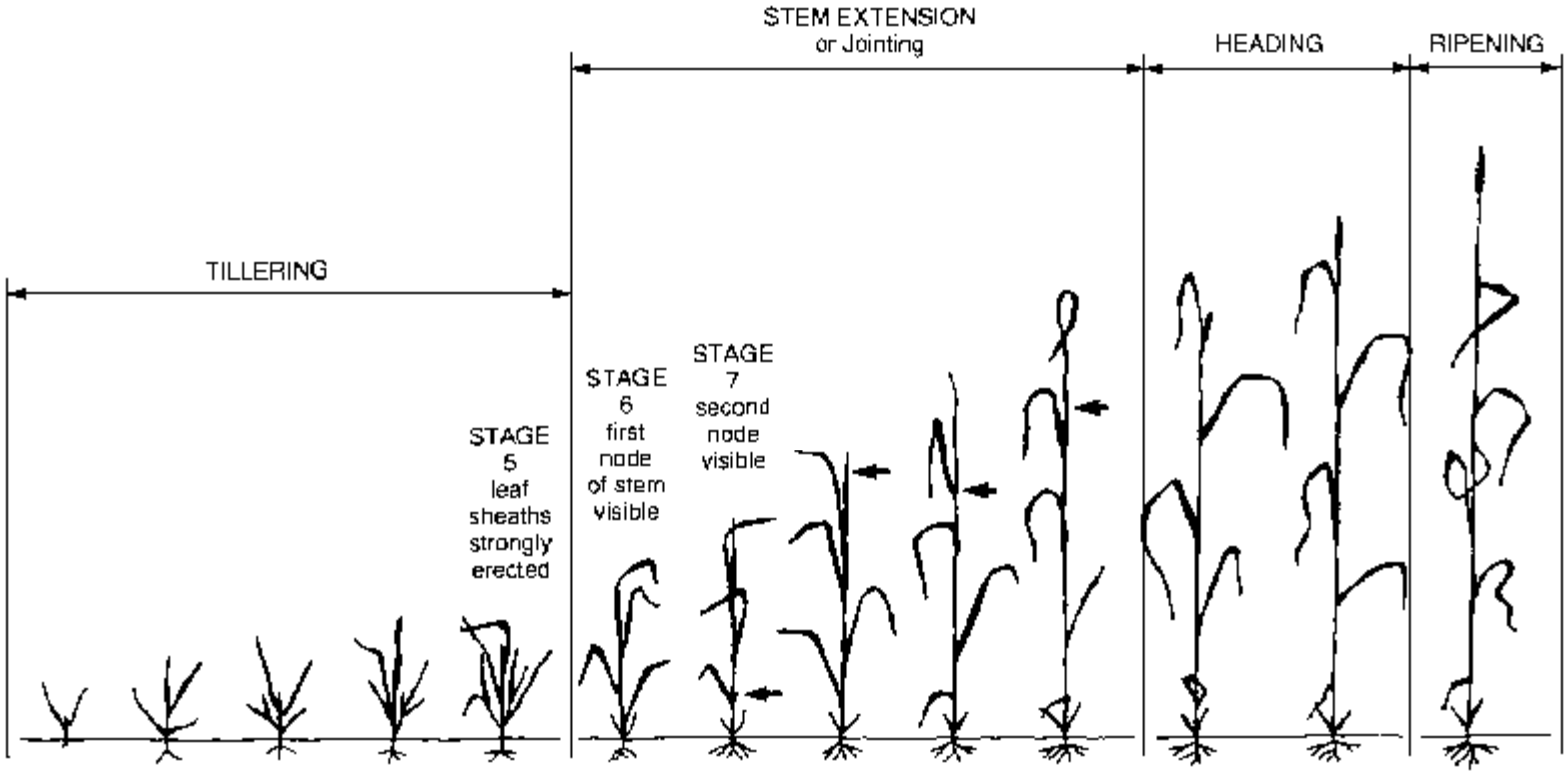
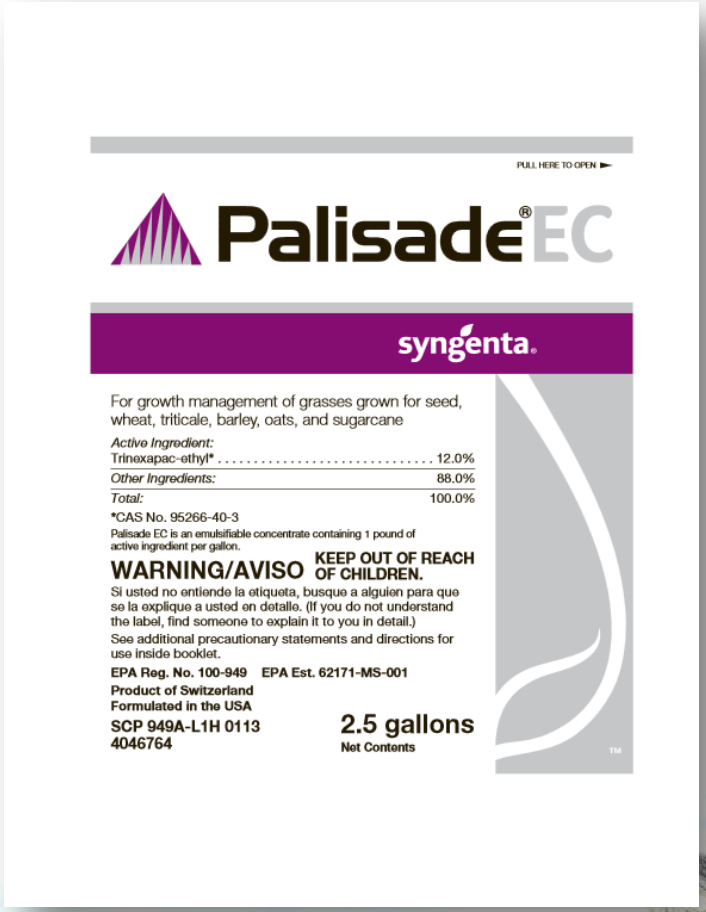


Image courtesy North Carolina State University; http://ipm.ncsu.edu/grain/smgrain521.html

- The ability to increase stem thickness and control plant height during the early stages of wheat development could theoretically reduce lodging potential

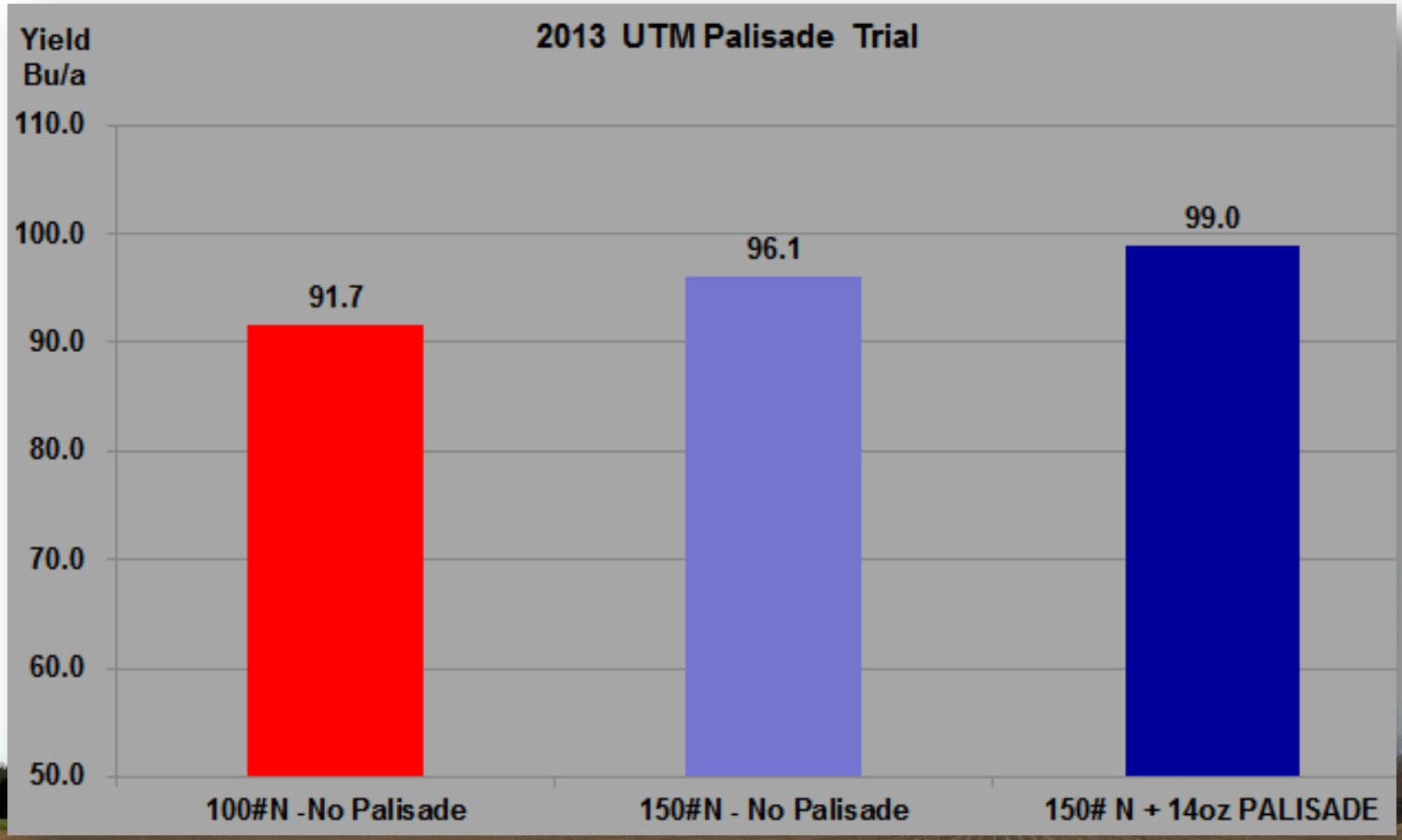
Growth Regulators

- Syngenta has recently introduced a plant growth regulator (PGR) for the purpose of reducing lodging potential
- Palisade EC (Syngenta)
  - Also available as 2EC
  - Active ingredient- Trinexapac-ethyl
  - Proposed benefits:
    - Shorten internode to lower center of gravity.
      - Reduce loss due to lodging
        - » Increase harvest speeds
        - » Allows for increased N rates
        - » Easier planting double crop beans
    - Target application timing: Feekes 4-8, Ideally target Feekes 5-7
    - Target rate: 10.5-14.4 fl oz/ac
    - Maximum rate of 14.4 fl oz/ac
    - 45 day pre-harvest interval



Growth Regulators

- Palisade EC Trial
  - Syngenta



Growth Regulators

- Palisade EC Trial
  - Syngenta

Growth Regulators

- Dr. Angela McClure conducted a Palisade strip trial in Crockett County during the spring of 2014
  - Objective:
    - evaluate Palisade at N rates of 130 and 160 lb N/ac
  - Treatment
    - Nitrogen
      - 30 lb Urea Fall 2013
      - 60 lb Urea in Jan 2014
      - Remainder (to result in total applications of 130, 160 or 190 lb N/ac –farmer was interested in highest rate) was applied as Ammonium Nitrate on March 26, 2014
    - Palisade EC
      - Applied at Feekes 5- right at the suggested target date
      - Applied with an insecticide, low rate of Stratego and a micronutrient product
      - Non-Palisade receiving controls received the same insecticide, low rate of Stratego and micronutrient product

Growth Regulators

- UT Extension Crockett County Palisade EC Trial
  - Results
    - All wheat (regardless of treatment) stood well through the season and no lodging was observed in the plots
    - Due to noticeable water damage, one treatment has been omitted.
    - This work will be repeated during the 2015 season

Treatment	Number Reps	Bu/Acre at 13.5%
Palisade +130 N	2	76.8
No Palisade + 130 N	3	76.3
Palisade +160N	3	81.2
No Palisade + 160 N	3	84.9
130 N (treated and untreated plots)	6	76.9
160 N (treated and untreated plots)	7	81.3
190 N (treated and untreated plots)	3	83.5

Disease Management

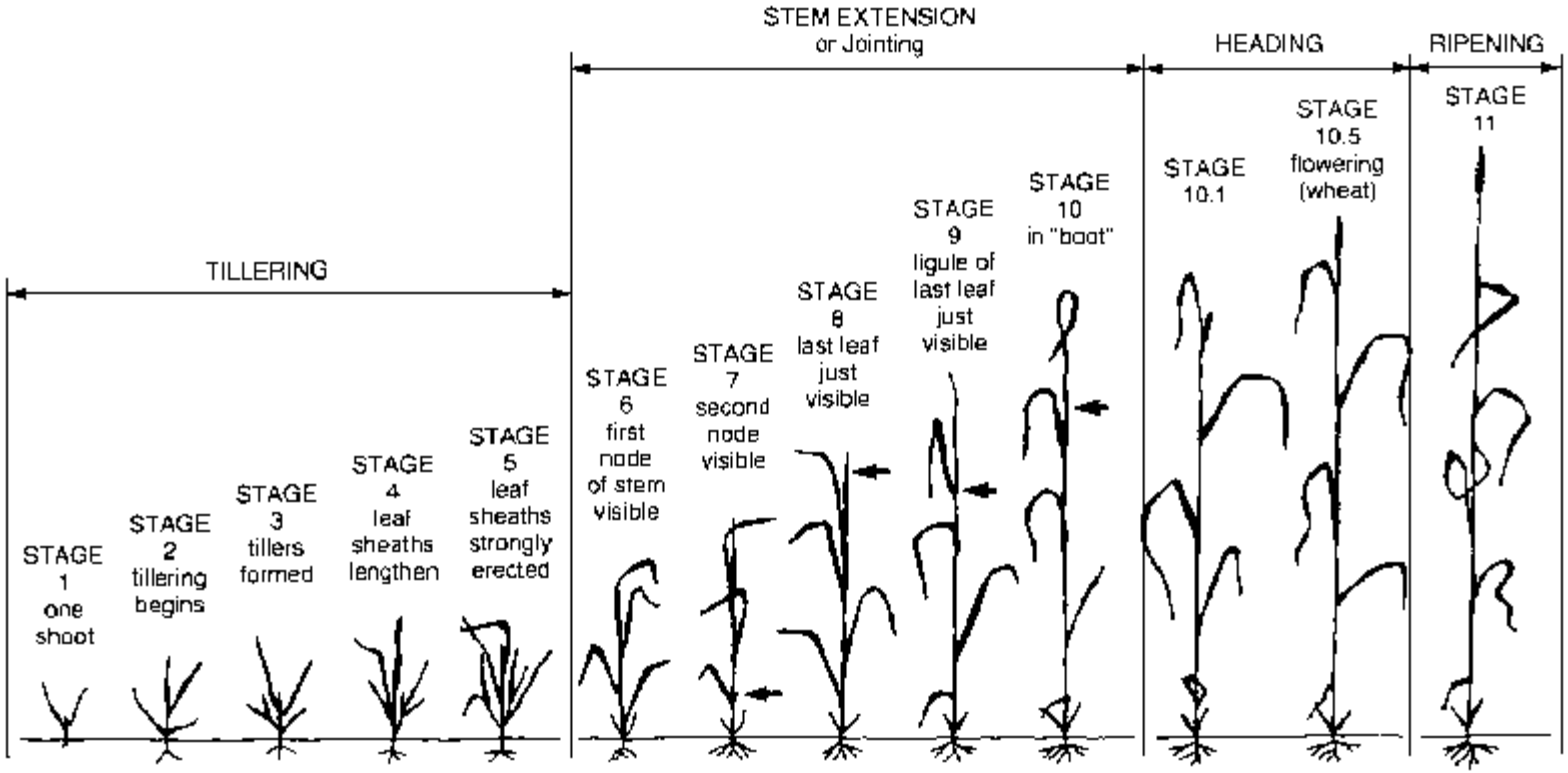
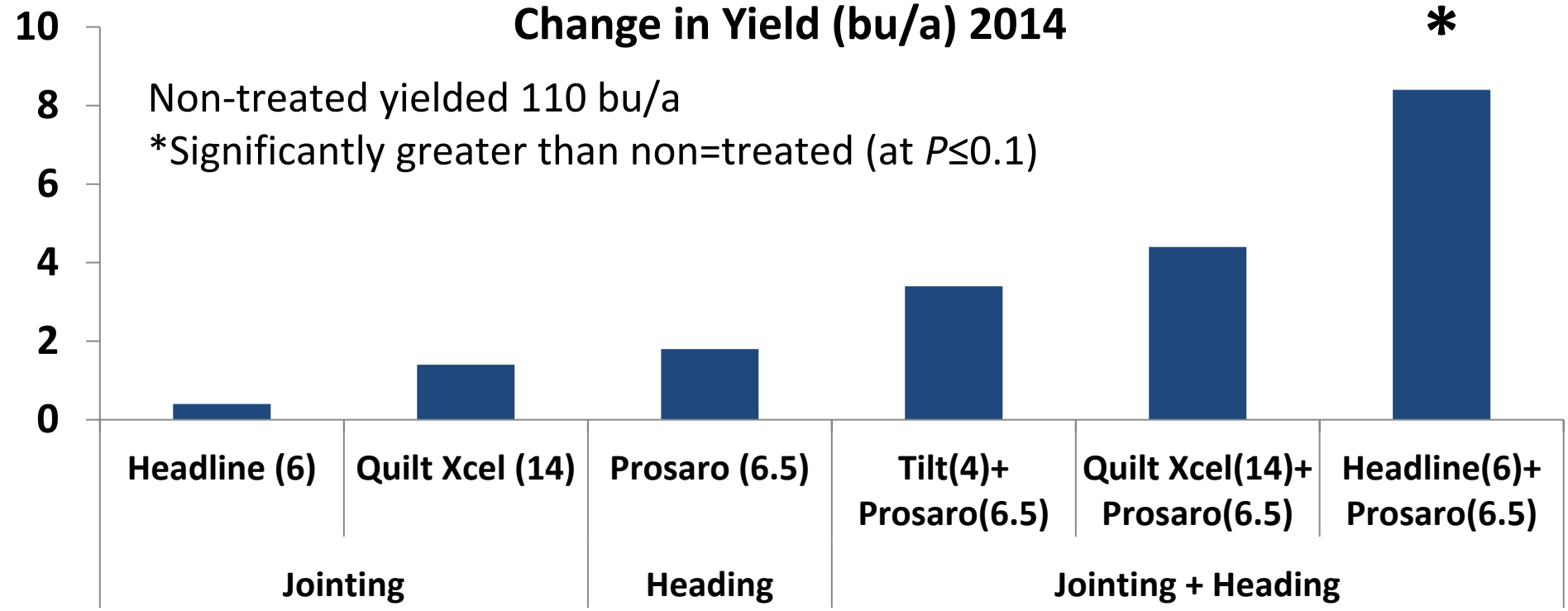


Image courtesy North Carolina State University; http://ipm.ncsu.edu/grain/smgrain521.html

- Understanding growth stage is also critical for determining if fungicide applications are necessary, and if so, when to time these applications.

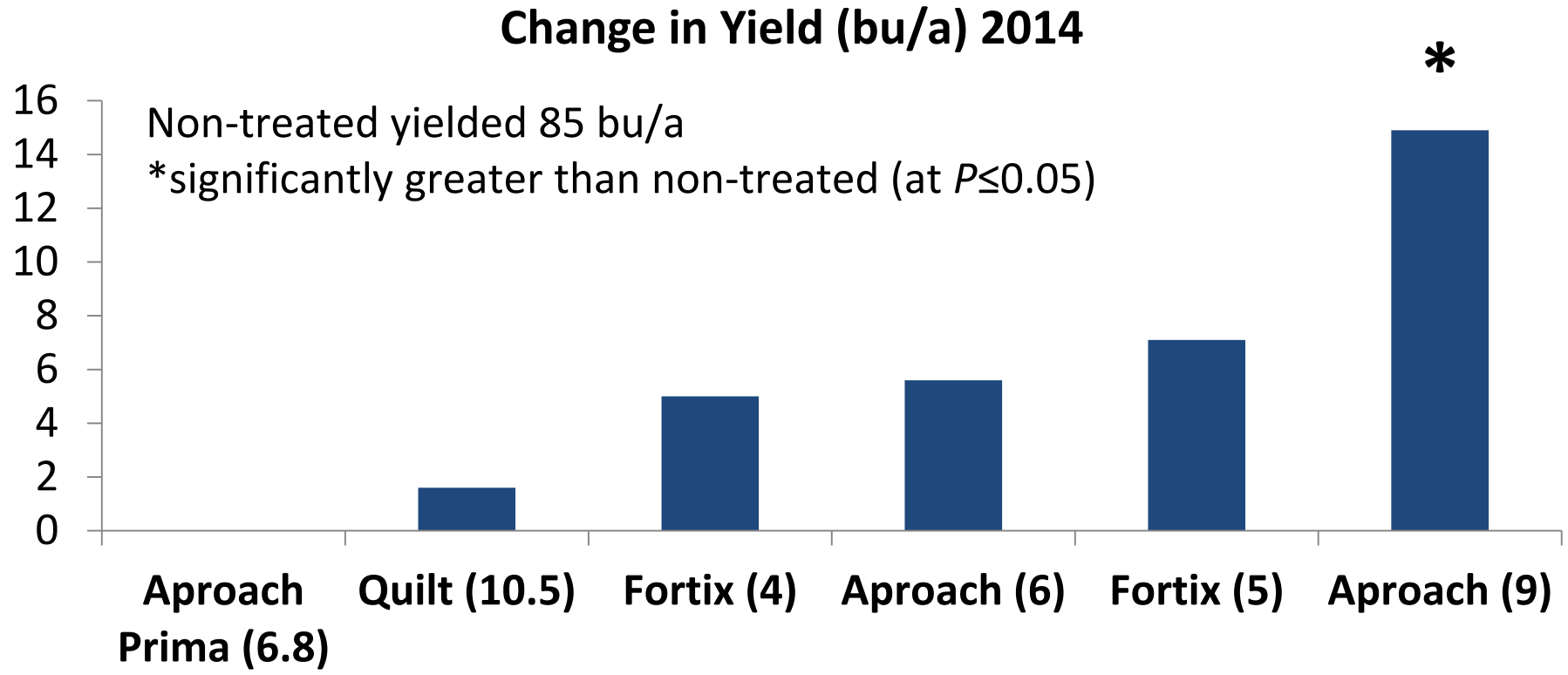
Fungicides

(2014 Jointing/Heading Applications)



- Trial Conducted by Dr. Heather Young-Kelly
- Two different locations in 2014, but significant response only noted at one location
- Single applications made at two different timings

Fungicides
(2014 Flag Leaf Application)



- Trial Conducted by Dr. Heather Young-Kelly
- Two different locations in 2014, but significant response only noted at one location
- Very low disease pressure

Fungicides

Table covering efficacy of fungicides for wheat disease control based on appropriate application timings: UTcrops.com (Wheat→ Insects & Diseases)

Efficacy of fungicides for wheat disease control based on appropriate application timing

Fungicide(s)				Powdery mildew	Stagonospora leaf/glume blotch	Septoria leaf blotch	Tan spot	Stripe rust	Leaf rust	Stem rust	Head scab	Harvest Restriction
Class	Active ingredient	Product	Rate/A (fl. oz)									
Strobilurin	Picoxystrobin 22.5%	Aproach SC	6.0 - 12	G[1]	--	VG	VG	E[2]	VG	VG	NR	Feekes 10.5 and 45 days
	Fluoxastrobin 40.3%	Evito 480 SC	2.0 – 4.0	G	--	--	VG	--	VG	--	NL	Feekes 10.5 and 40 days
	Pyraclostrobin 23.6%	Headline SC	6.0 - 9.0	G	VG	VG	E	E[2]	E	G	NL	Feekes 10.5
Triazole	Metconazole 8.6%	Caramba 0.75 SL	10.0 - 17.0	VG	VG	--	VG	E	E	E	G	30 days
	Propiconazole 41.8%	Tilt 3.6 EC[3]	4.0	VG	VG	VG	VG	VG	VG	VG	P	Feekes 10.54
	Prothioconazole 41%	Proline 480 SC	5.0 - 5.7	--	VG	VG	VG	--	VG	VG	G	30 days
	Tebuconazole 38.7%	Folicur 3.6 F[3]	4.0	G	VG	VG	VG	E	E	E	F	30 days
	Prothioconazole19% Tebuconazole 19%	Prosaro 421 SC	6.5 - 8.2	G	VG	VG	VG	E	E	E	G	30 days
Mixed modes of action[4]	Metconazole 7.4% Pyraclostrobin 12%	TwinLine 1.75 EC	7.0 – 9.0	G	VG	VG	E	E	E	VG	NL	Feekes 10.5
	Fluxapyroxad 14.3% Pyraclostrobin 28.6%	Priaxor	4.0 - 8.0	G	VG	VG	E	VG	VG	G	NL	Feekes 10.5
	Propiconazole 11.7% Azoxystrobin 7.0%	Quilt 200 SC[3]	10.5 - 14.0	VG	VG	VG	VG	E	E	VG	NL	Feekes 10.5
	Propiconazole 11.7% Azoxystrobin 13.5%	Quilt Xcel 2.2 SE	10.5 - 14.0	VG	VG	VG	VG	E	E	VG	NL	Feekes 10.5
	Prothioconazole 10.8% Trifloxystrobin 32.3%	Stratego YLD	4.0	G	VG	VG	VG	VG	VG	VG	NL	Feekes 10.5 35 days
	Cyproconazole 7.17% Picoxystrobin 17.94%	Aproach Prima SC	3.4-6.8	G	--	VG	VG	E	VG	--	NR	45 days

[1] *Efficacy categories: NL=Not Labeled; NR=Not Recommended; P=Poor; F=Fair; G=Good; VG=Very Good; E=Excellent; -- = Insufficient data to make statement about efficacy of this product.*

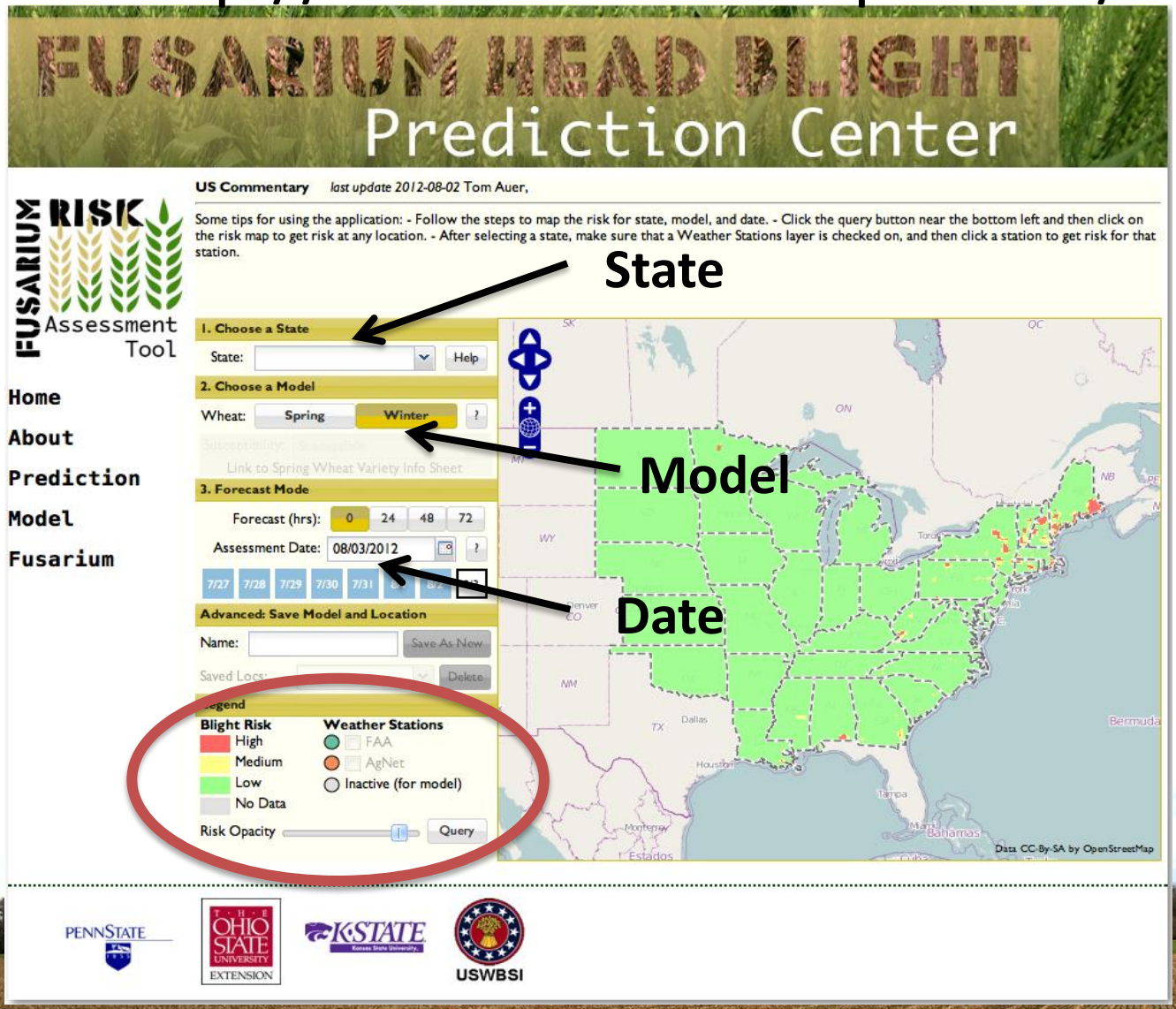
[2] *Efficacy may be significantly reduced if solo strobilurin products are applied after stripe rust infection has occurred.*

[3] *Multiple generic products containing the same active ingredients also may be labeled in some states. Products including tebuconazole include: Embrace, Monsoon, Muscle 3.6 F, Onset, Orius 3.6 F, Tebucon 3.6 F, Tebustar 3.6 F, Tebuzol 3.6 F, Tegrol, and Toledo. Products containing propiconazole include: Bumper 41.8 EC, Fitness, Propiconazole E-AG, and PropiMax 3.6 EC. Products containing propiconazole + azoxystrobin include: Avaris 200 SC.*

[4] *Products with mixed modes of action generally combine triazole and strobilurin active ingredients. Priaxor is an exception to this general statement and combines carboxamide and strobilurin active ingredients.*

Disease Management

http://www.wheatscab.psu.edu/



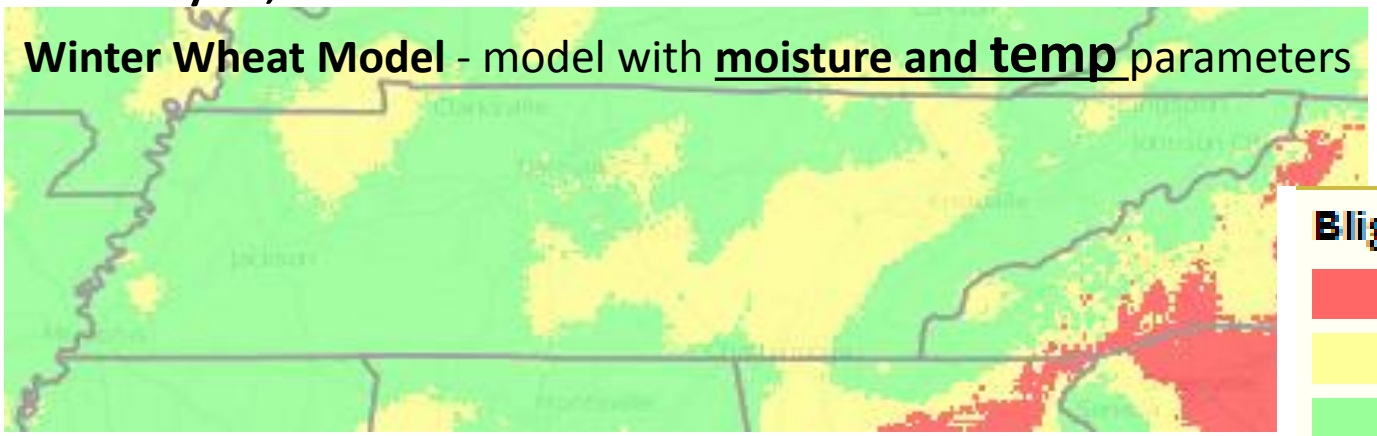
Many are concerned with DON after 2014.

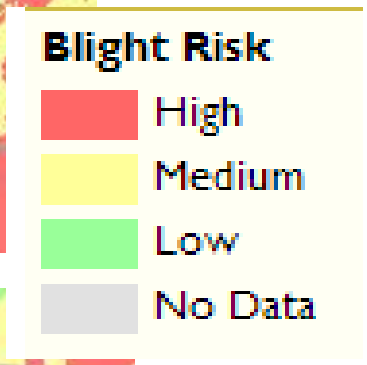
Visit the site as the crop in your area is approaching heading and flowering. You can customize the prediction by selecting a **state**, use the **winter wheat model**. You can also select different assessment **dates** through a calendar interface.

FHB Forecasting Model

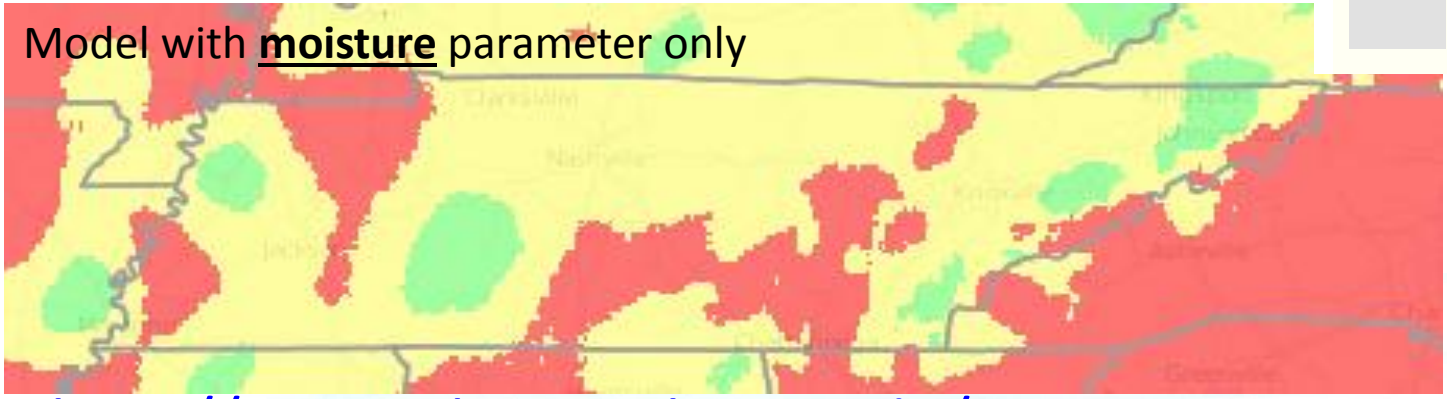
- May 4, 2013

Winter Wheat Model - model with **moisture and temp** parameters





Model with **moisture** parameter only



http://www.wheatscab.psu.edu/

Disease Management in 2015?

- Watch the weather
  - Relatively warm?
  - Relatively wet?
- Use FHB Forecasting website (http://www.wheatscab.psu.edu/)
- Avoid QoI/Strobilurin fungicides around flowering
  - Can increase DON levels
  - Instead, use a Triazole

Disease Management

- Know your variety's disease resistance/susceptibility level
- Scout for diseases
- Consider foliar fungicides if:
  - Disease is present
  - Can properly time application
  - Application can increase yields at a level to cover application cost and risk
    - Take into account price of wheat
- More information can be found at: UTcrops.com

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