Flag Leaf N Demo Project 2011

- Tissue testing has increased greatly the past several years
- Agronomists keep asking if flag leaf N can be used to predict final protein or help determine “yes” or “no” to “foliar N” after anthesis
- Demonstration project started to show proper timing for flag leaf sampling and how sampling date affects flag leaf N concentration

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Predicting N fertilizer Need for Protein based on Flag Leaf N?

- Little University research to interpret flag leaf N in relation to final grain protein
- U of M – 2010-11research – Dan Kaiser and Yochum Wiersma U of M
- Some research on irrigated wheat from MT, ID, OR
    - Nitrogen Management for Hard Wheat Protein Enhancement – PNW 587

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Late Season N

- N applied after vegetative growth is used primarily for protein
- The protein increase from late N depends on the N rate applied and the N content of the wheat at flag leaf
- The economic return from foliar N (after anthesis) depends on the cost of fertilizer N and application, the protein increase achieved and the protein discount or premium

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Late Season N Decisions?

- When to take the Flag leaf sample?
  - Just as main stem heads are emerging?
  - When flowering begins on main stems?
  - When flowering is completed?

Flag Leaf %N
How Does it Change?

- AGVISE Demo Project
- Hatton ND Wheat Field
  - Planted on time (well drained loam field)
  - Flag leaf sample collected every few days
  - Three samples collected from site to achieve average
  - Stage recorded and pictures taken

Wheat Field Information

- Variety - Barlow
- Fertilizer
  - 117 lb actual N as urea, late fall with tillage
  - Starter (12-25-10)
- Previous Crop - Dry beans
- Fungicide - Folicure

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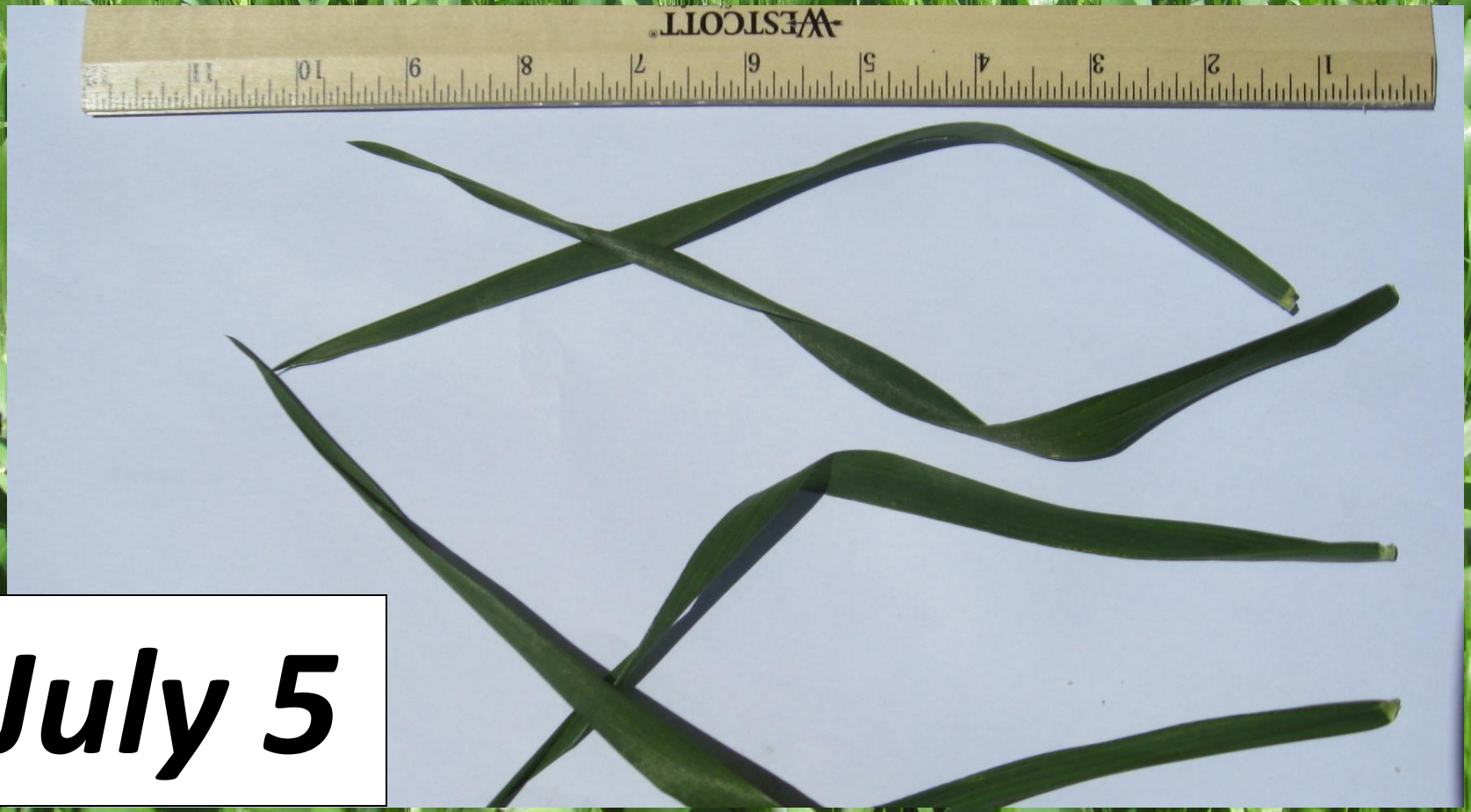
July 5



July 5

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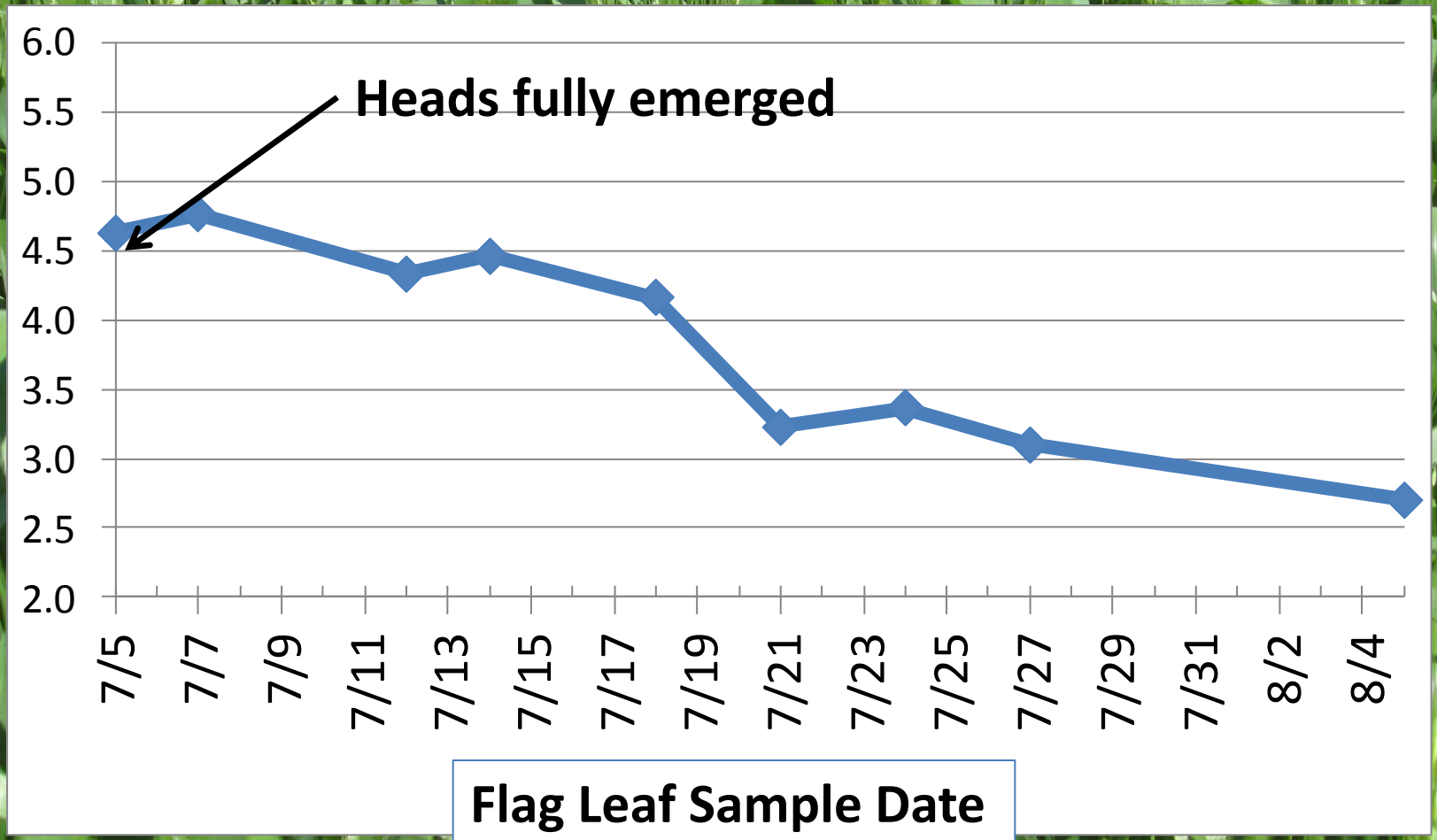
July 9 – Anthesis starting

July 13– Main stem Anthesis

%N Flag Leaf – Wheat
Hatton Wheat Field 2011



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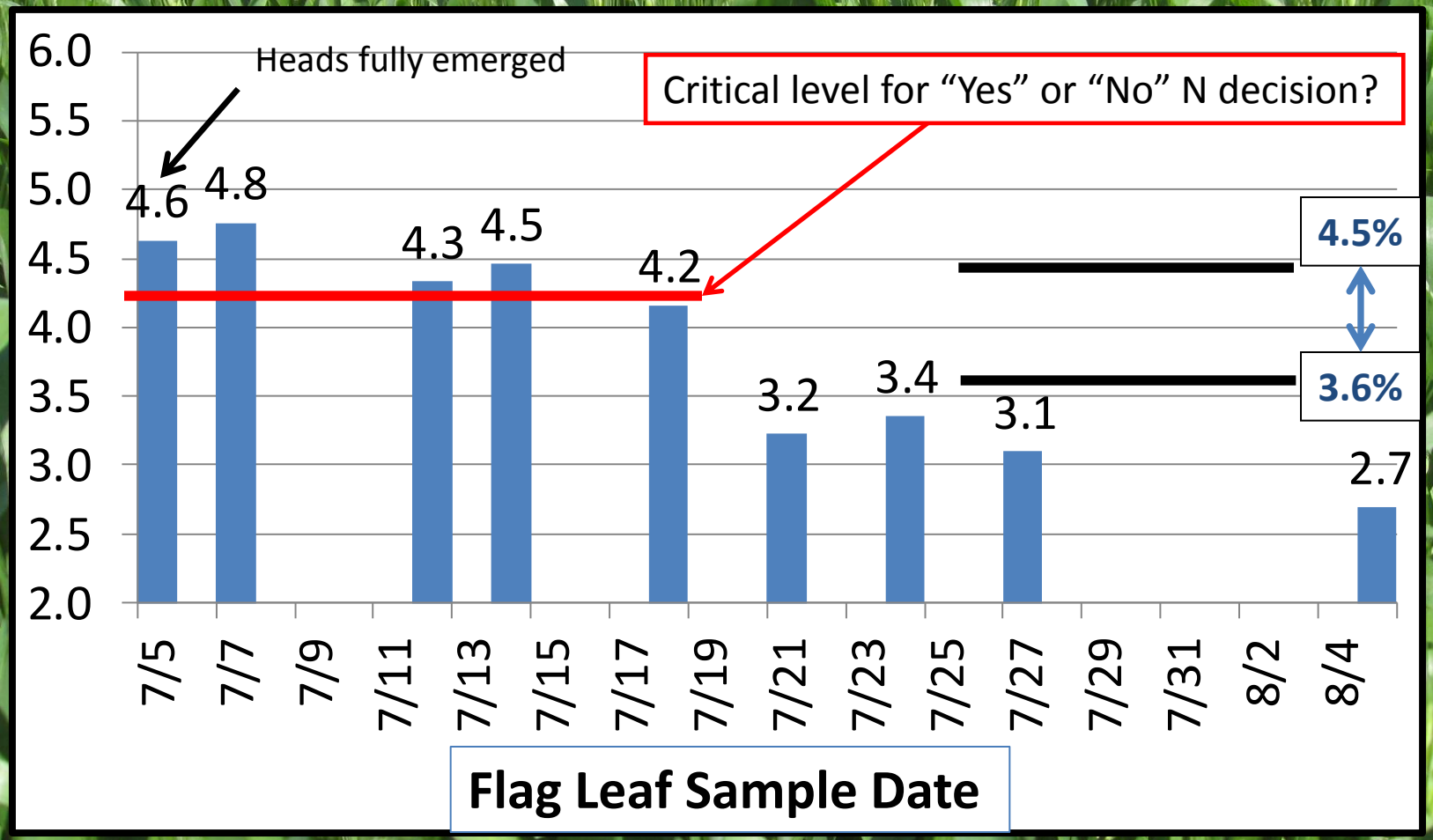
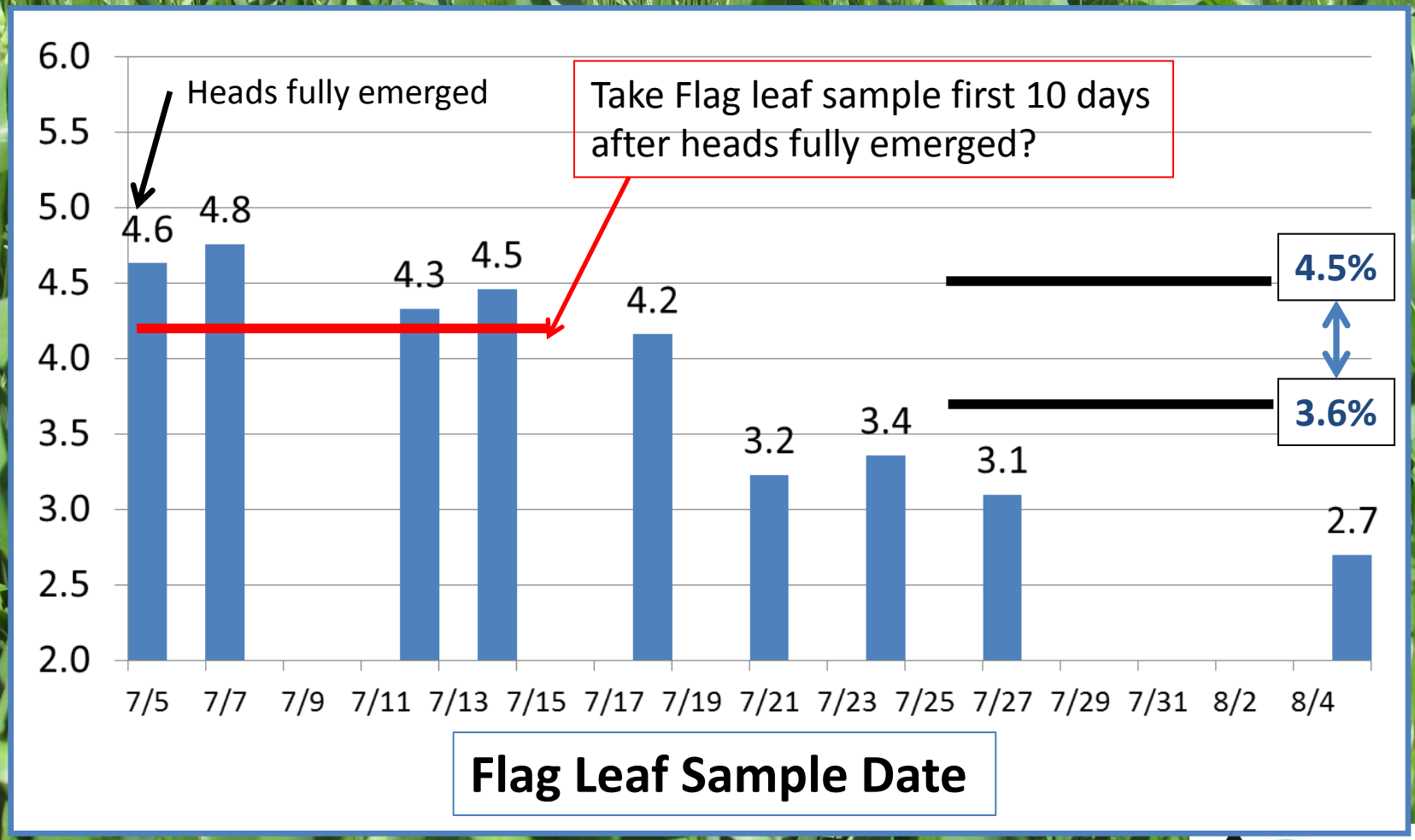
%N Flag Leaf
Hatton Wheat Field - 2011



%N Flag Leaf – Wheat
Hatton Wheat Field 2011



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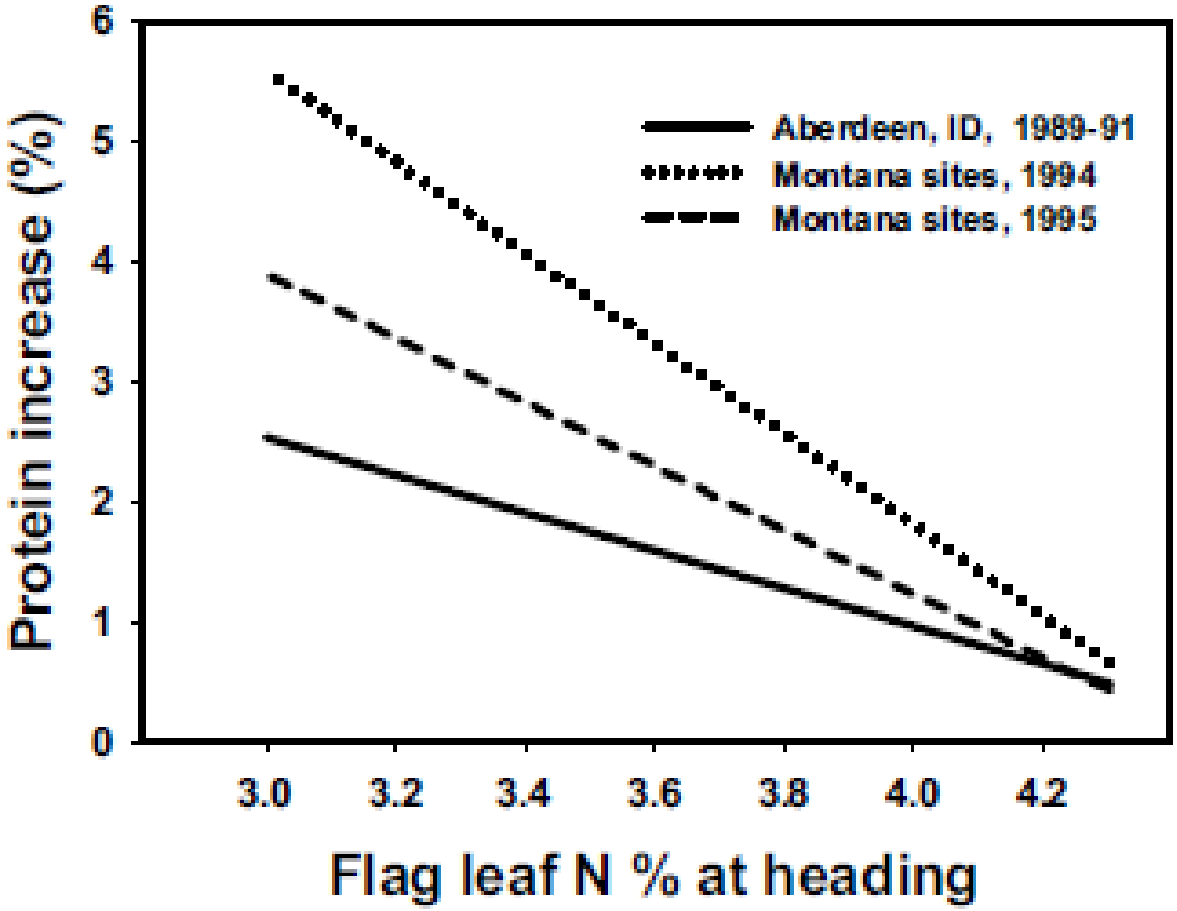
Harvest Information

- Yield 50 bu/a
- Protein 14.2-14.5%
- Post harvest soil test – 42 lb/a Nitrate

Western research shows that late N does not increase grain protein if flag Leaf N is higher then 4.2-4.3% – PNW – 587- March 2005

Fig. 14. Hard red spring wheat protein increase from 40 pounds late season applied N/acre as affected by flag leaf N percentage at heading in different locations or years.



What to do with Flag %N Values?

- 4.2%-4.3% value comes from irrigated spring wheat in Montana and Idaho
  - Critical value in our region probably is different
  - Maybe research can be conducted in our region
- If you are taking flag leaf samples!
  - Get the sample early for the best data
  - Early flag to early flowering (8-10 days)
  - Later samples result in lower %N and make every field look like it needs late N to make decent protein

What about the other Nutrients and sampling date?

	7-5	7-7	7-12	7-14	7-18	7-21	7-25	7-27	8-5
N	S	H	H	S	S	L	L	D	D
P	S	S	S	S	L	L	L	L	L
K	S	L	L	L	L	L	L	L	D
Zn	S	S	S	L	L	S	L	L	L
Cu	S	L	S	S	S	S	S	L	L
Cl	D	D	D	D	D	D	D	D	D

Correct sampling time

Wrong Sampling Time - Too Late - Bad Interpretation

Main stem anthesis completed

H = high, S = Sufficient, L = Low, D = Deficient

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Questions?