

# ***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

# ***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 – 2010-11 research – 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

# *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



# *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

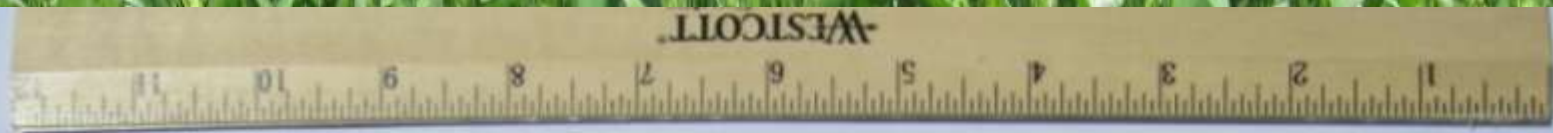
# ***Wheat Field Information***

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



***July 5***





***July 5***



***July 9 – Anthesis starting***



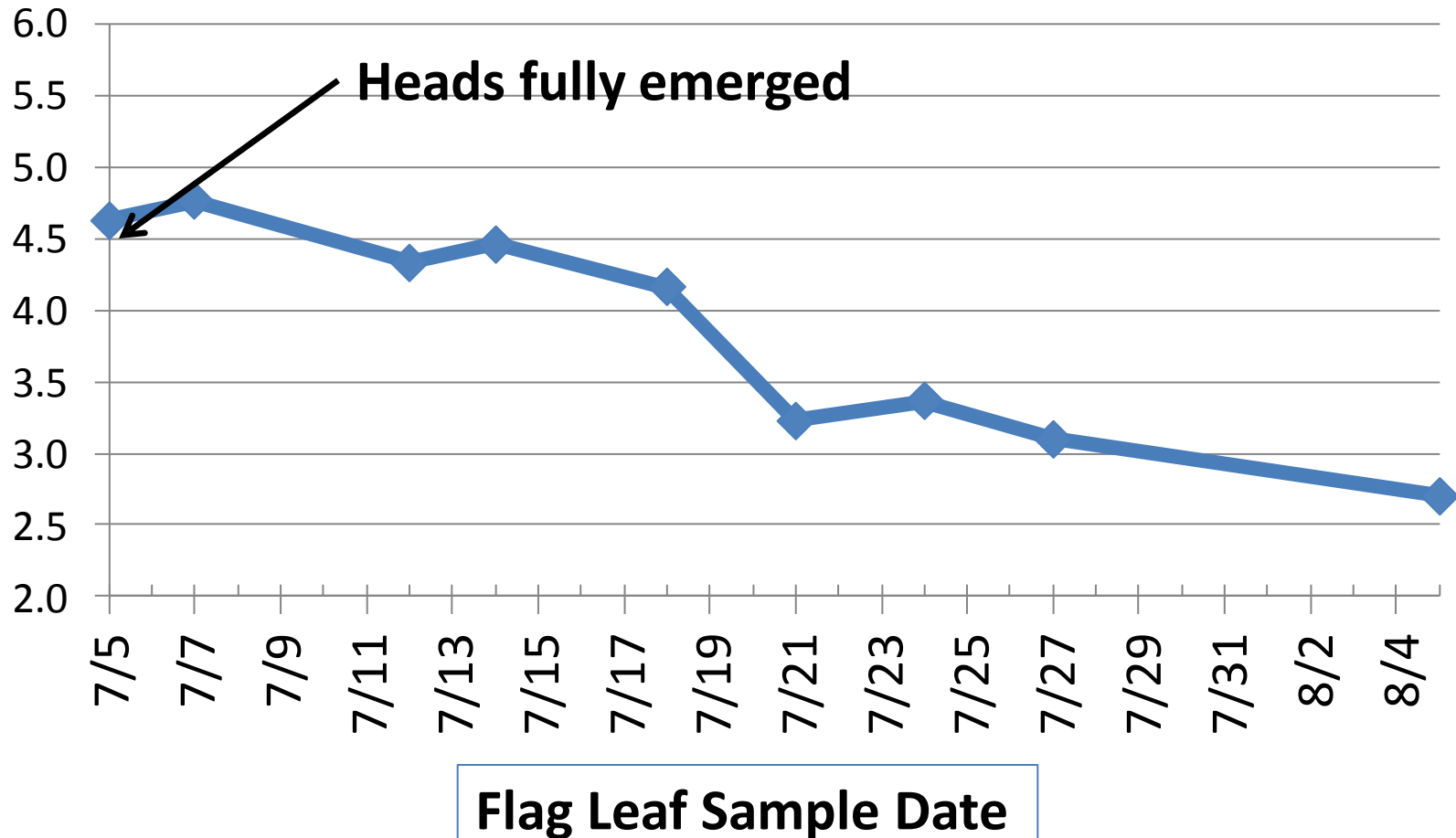
# ***July 13– Main stem Anthesis***





# ***%N Flag Leaf – Wheat Hatton Wheat Field 2011***

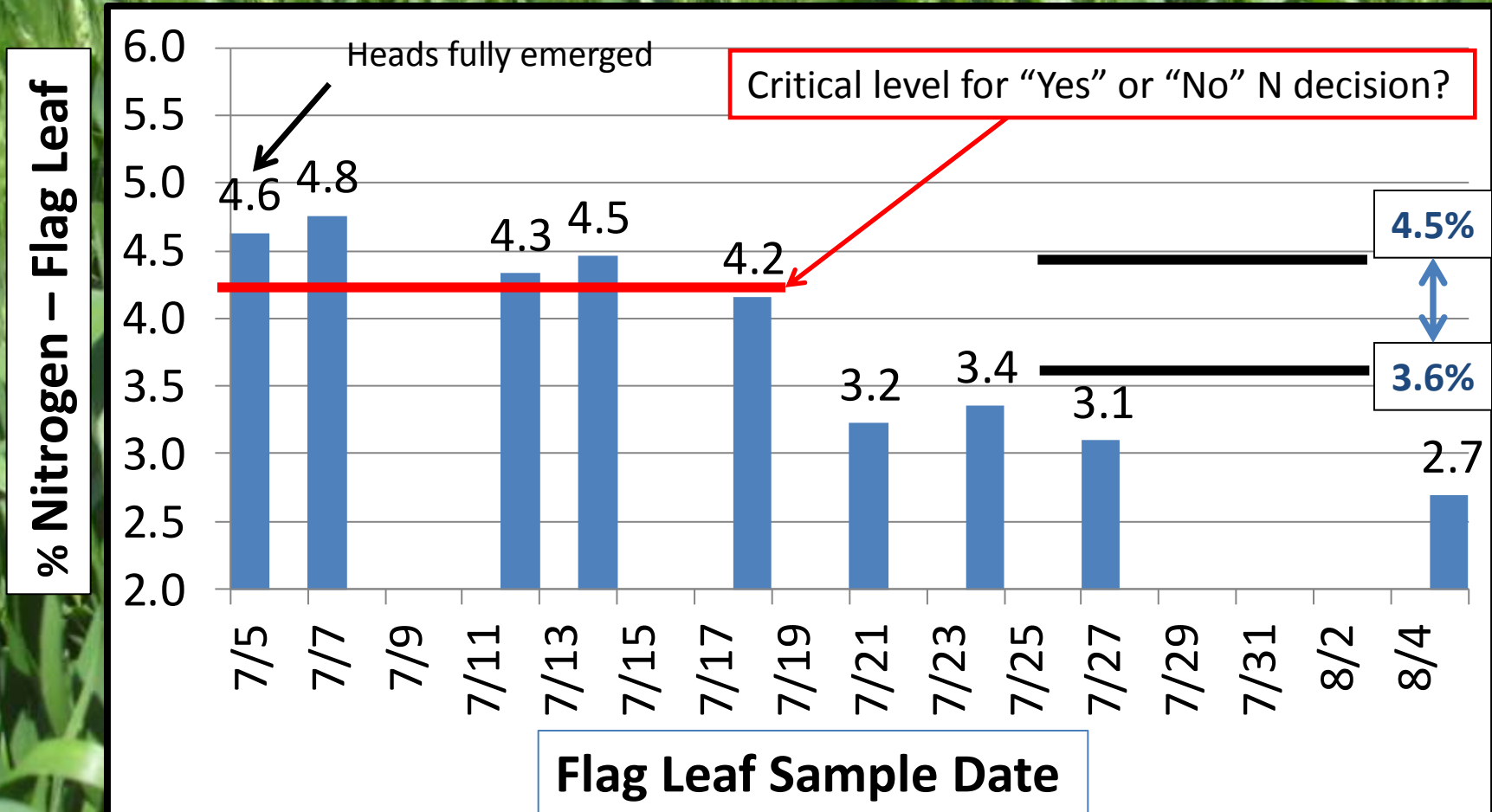
**% Nitrogen – Flag Leaf**



**Flag Leaf Sample Date**

# *%N Flag Leaf*

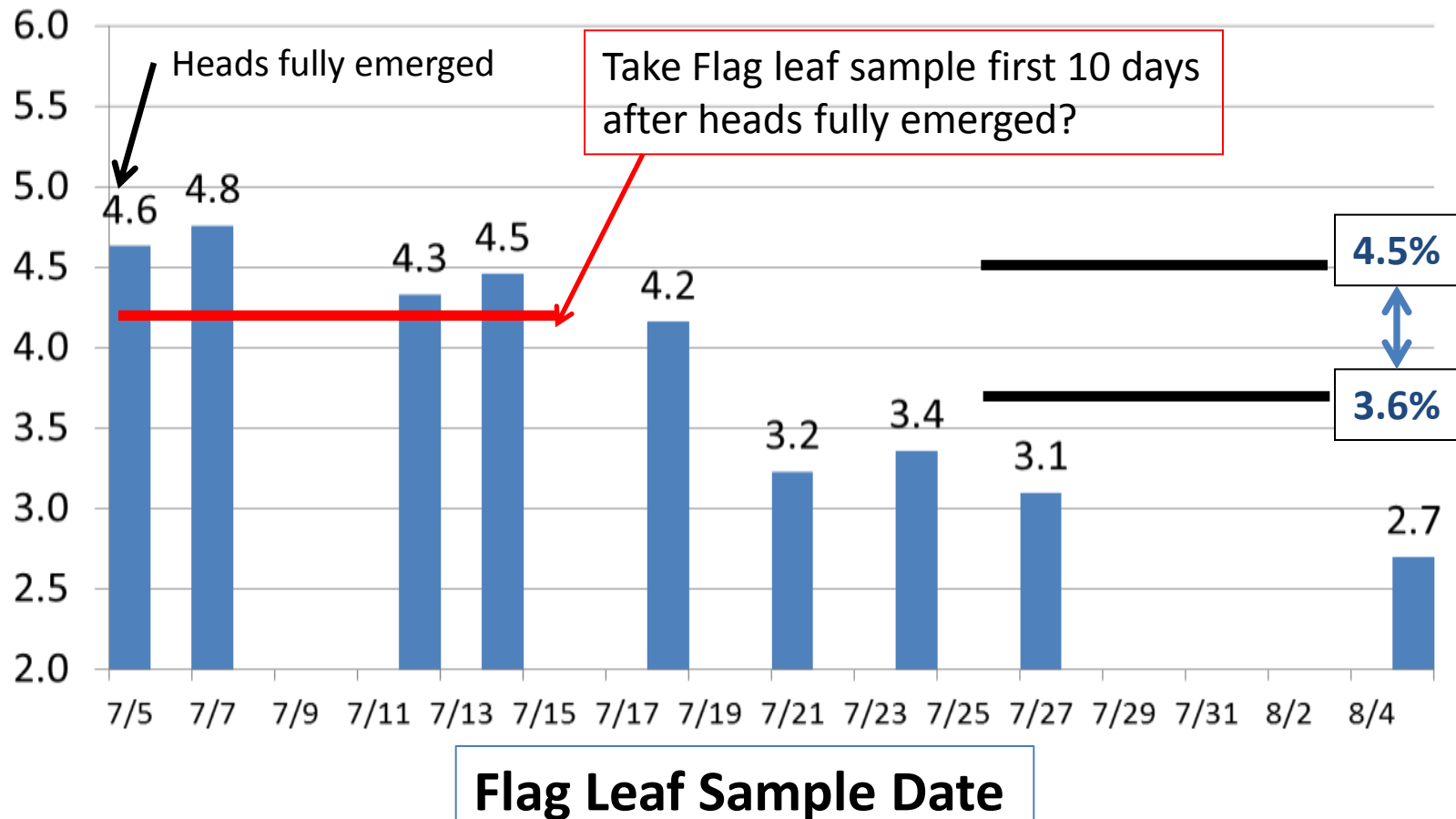
## *Hatton Wheat Field - 2011*





# *%N Flag Leaf – Wheat Hatton Wheat Field 2011*

**% Nitrogen – Flag Leaf**



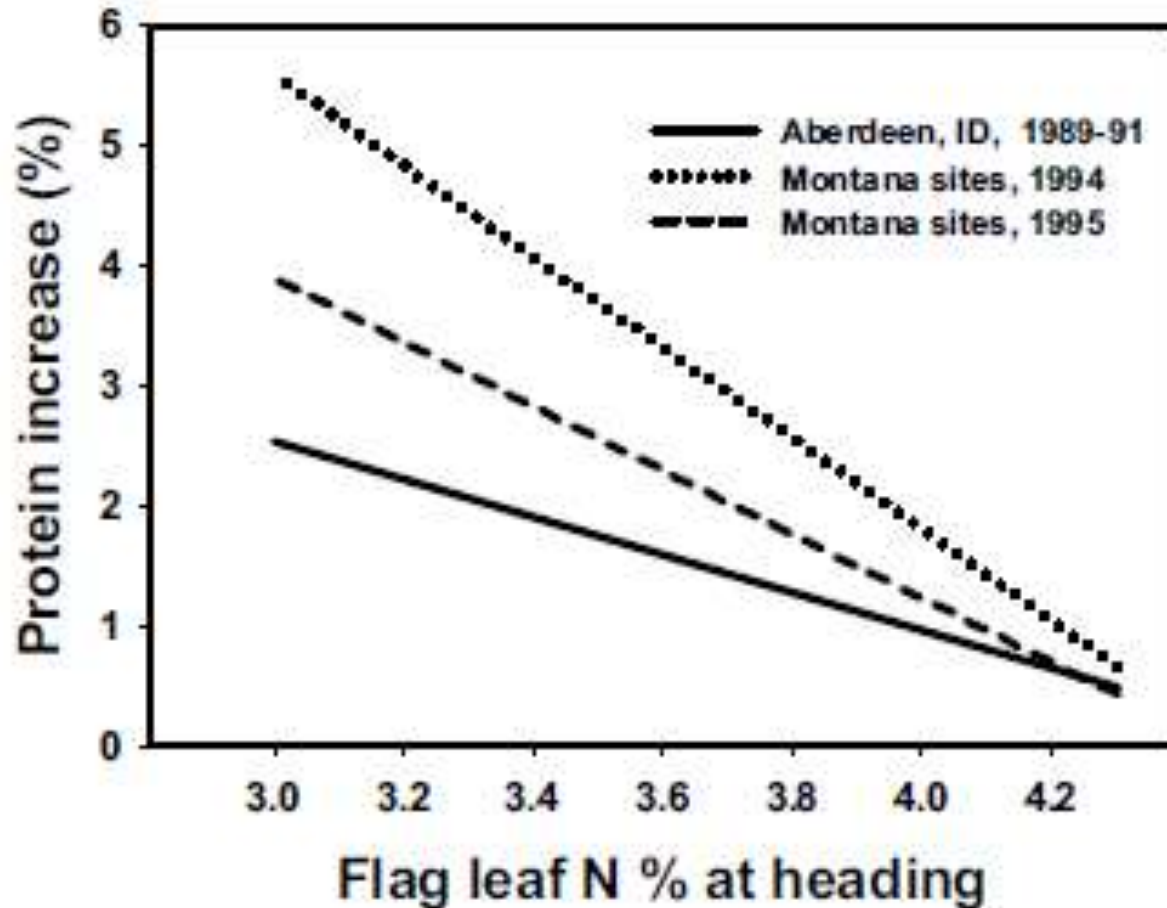
# ***Harvest Information***

- 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 than 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



***Questions?***

