The New Economics of Crop Production in Wisconsin: Crop Consultants' Perspective

Paul D. Mitchell
Assistant Professor
Agricultural and Applied Economics
University of Wisconsin-Madison

2008 WAPAC Spring Seminar
Arlington, WI
March 6, 2008

Goal Today

Part I:

- Economics of Corn vs. Soybeans vs. Wheat

Part II:

- Overview Crop Insurance
- Crop Insurance Hints for 2008
- Crop Insurance changes coming

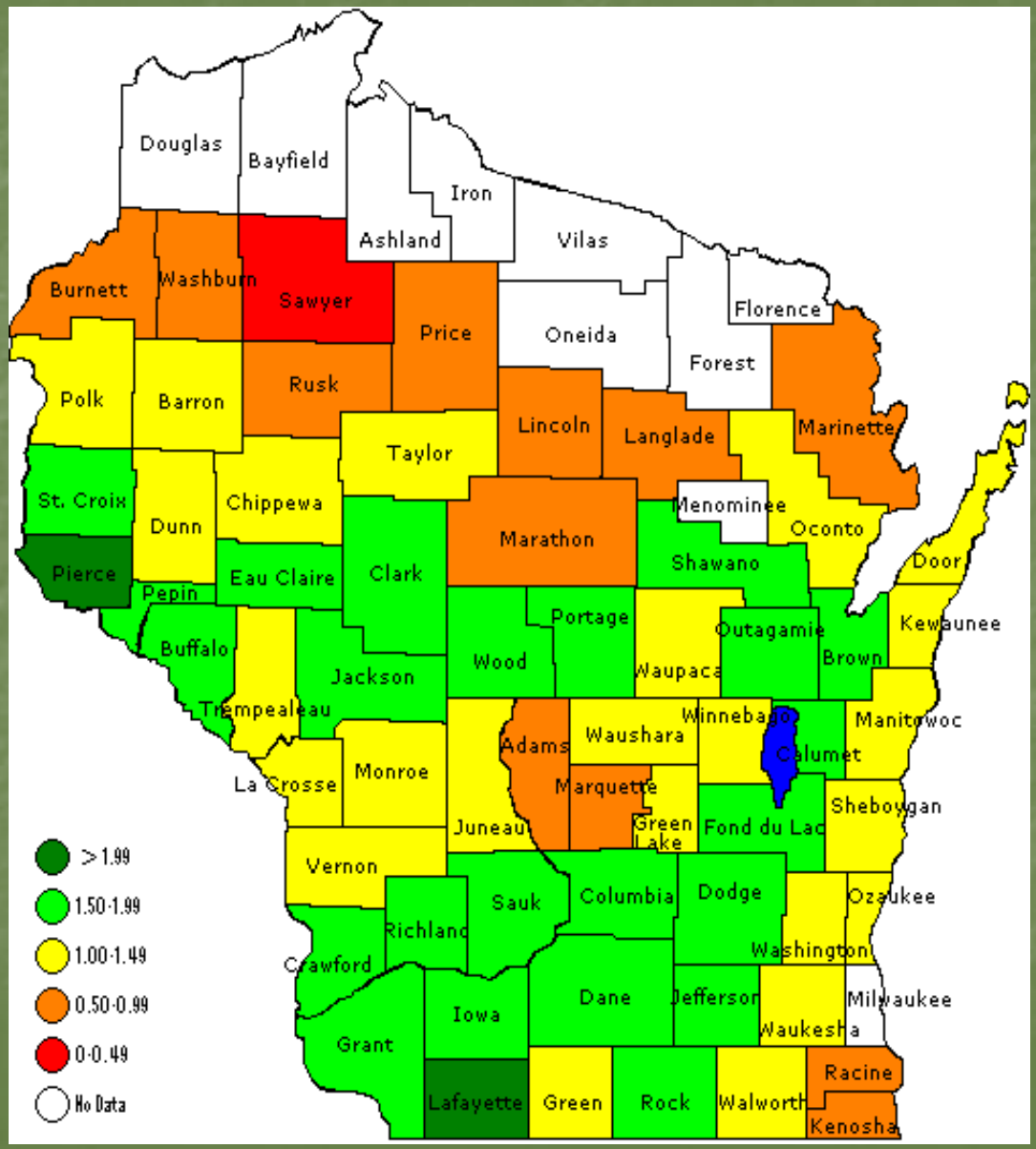
Crop Prices are High

- Closing prices on CBOT Wednesday 3/5
- Dec 08 corn $5.77/bu
- Nov 08 soybean $13.91/bu
- Sep 08 wheat $10.59/bu
- Sep 08 oats $4.45/bu

- These prices drive the image that farmers are rolling in the money

The "New" Economics of Corn and Soybeans

Yields are Increasing



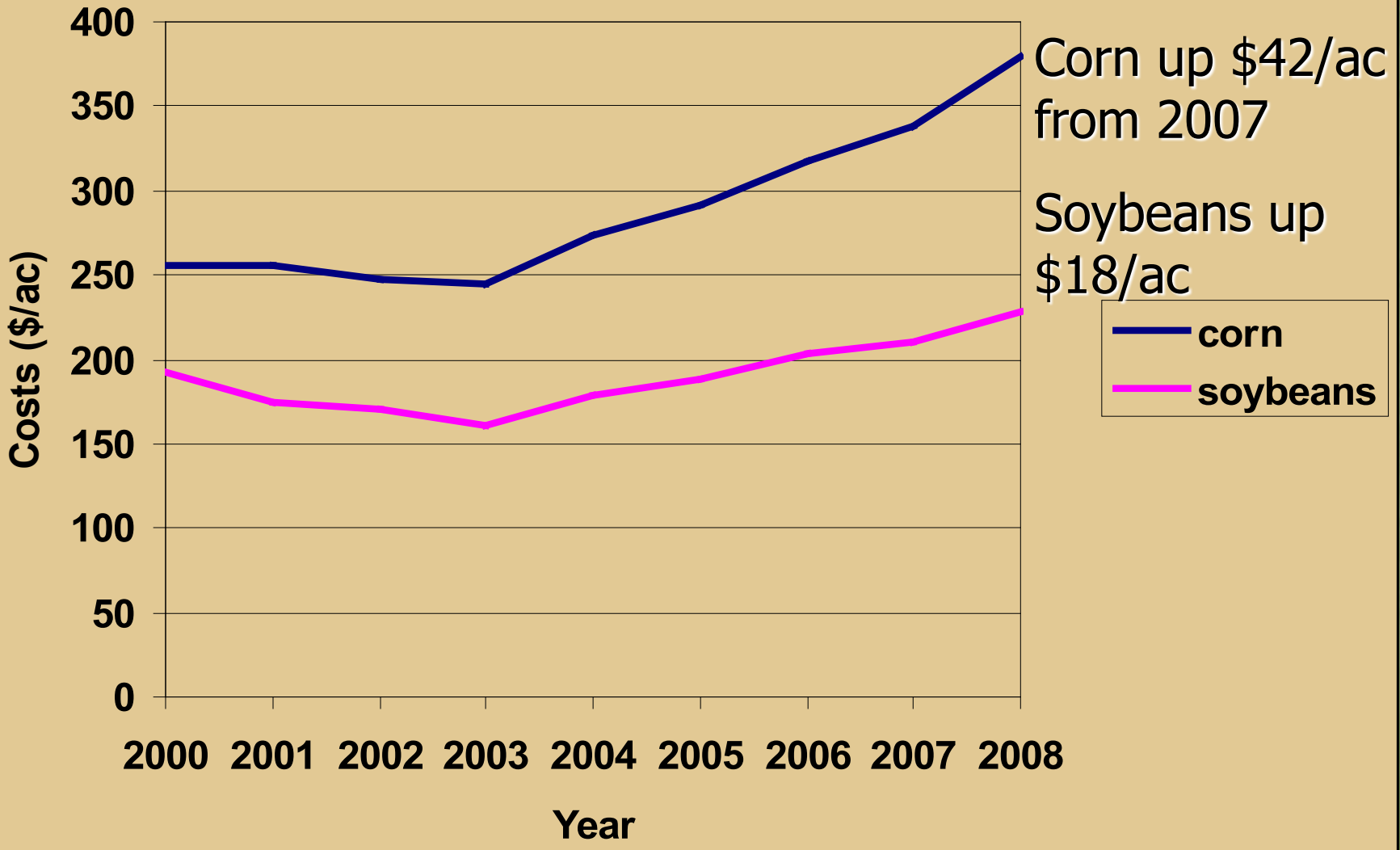
Annual increase (bu/ac) in NASS county average yield from 1977 to 2006 as estimated by regression

Input Costs Have Also Increased

- Fertilizer prices are leading the way
- Seed is also up about 15%

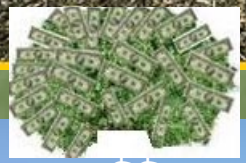
Fertilizer	Jan 2008	Jan 2007	% increase
Urea	505	409	23%
Anhydrous	775	514	51%
32% N Solution	403	269	50%
Ammonium Sulfate	240	209	15%
DAP	578	334	73%
Potash	418	254	65%

U of IL non-land costs for corn and soybean production in northern IL



Annual Increase: U of IL non-land costs for corn and soybeans in northern IL

The "Real" Economics of Corn and Soybeans



$$
$$
$$

Quick Cost of Production Estimates

- Quick cost of production and net returns estimates for corn, soybeans and wheat in Wisconsin
- Use major cost categories
- Neither scientific nor rigorous, but based on simple assumptions
- Farmers should do their own cost and returns projections

Fertilizer Costs

	Price	Corn		Soybeans		Wheat	
	$/lb	Amt	Cost	Amt	Cost	Amt	Cost
N	0.60	150	90.00	0	0	80	48.00
P	0.50	10	5.00	50	25.00	40	20.00
K	0.35	10	3.50	50	17.50	40	14.00
		Total	98.50		42.50		82.00

Seed Costs

- Corn
  - 34,000/ac @$190/bag = $80.75
- Soybeans
  - 1.2 bag/ac @ $32/bag = $38.40
- Wheat
  - Assume $35/ac
  - Lots of numbers out there
  - Depends on variety, germination rate, etc.

Input Cost Summary

Item	Corn	Soybeans	Wheat
Fertilizers	98.50	42.50	82.00
Seed	80.75	38.40	35.00
Pesticides	30.00	25.00	20.00
Insurance (75% CRC)	33.00	27.00	11.50
Miscellaneous	10.00	10.00	10.00
Interest (8% @8 mo.)	13.45	7.62	8.45
TOTAL	**265.70**	**150.52**	**166.95**

Machinery Costs

- Hard to estimate/measure
- Very specific to each farmer
- Use estimates for 2008 machinery costs from Iowa State University
- Adjusted upwards for WI about 25% for pre-harvest tillage, about 5% for harvest
  - Smaller fields and farms
  - Higher custom rates

Machinery Costs

Item	Corn	Soybeans	Wheat
Pre-Harvest	38.50	32.00	28.00
Harvest (Combine)	27.50	27.00	25.00
Haul/Handle	11.00	3.50	6.00
Dry	40.00	0.00	3.00
TOTAL	**117.00**	**62.50**	**62.00**

Cost Estimate Summary

Item	Corn	Soybeans	Wheat
Inputs	266	150	167
Machinery	117	63	62
TOTAL	$383/ac	$213/ac	$229/ac
Range (±25%)	$285-$480	$160-$265	$170-$290

Does not include cost for land, management, or investment of capital

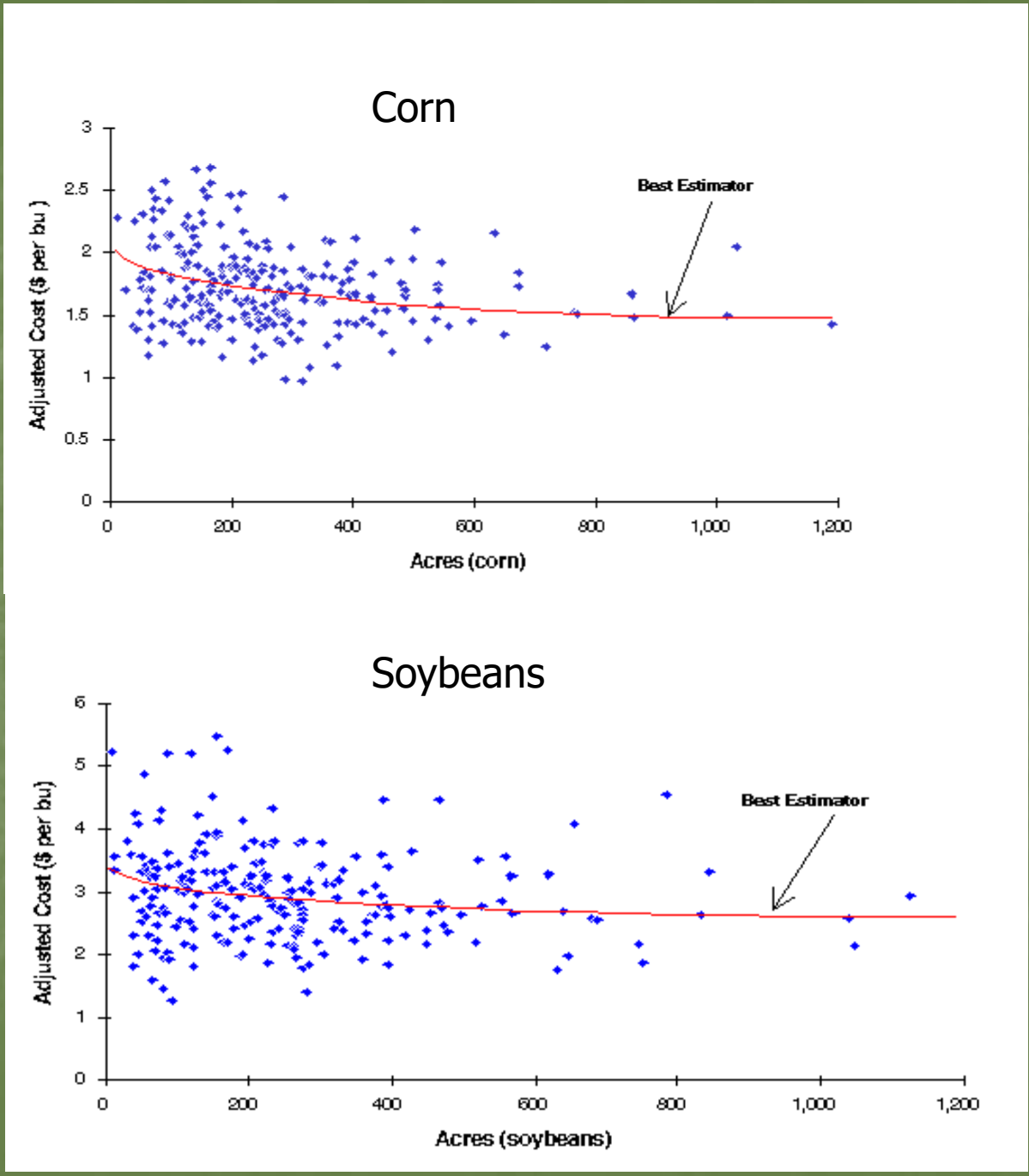
Net Returns

	Corn	Soybeans	Wheat
Yield	180	50	75
Price	5.25	13.40	10.00
Revenue	945	670	750
Costs	383	213	229
Returns to land and operator	562	457	521
Rent	200	200	200
Net Return	362	257	321

How do you decide what to plant?

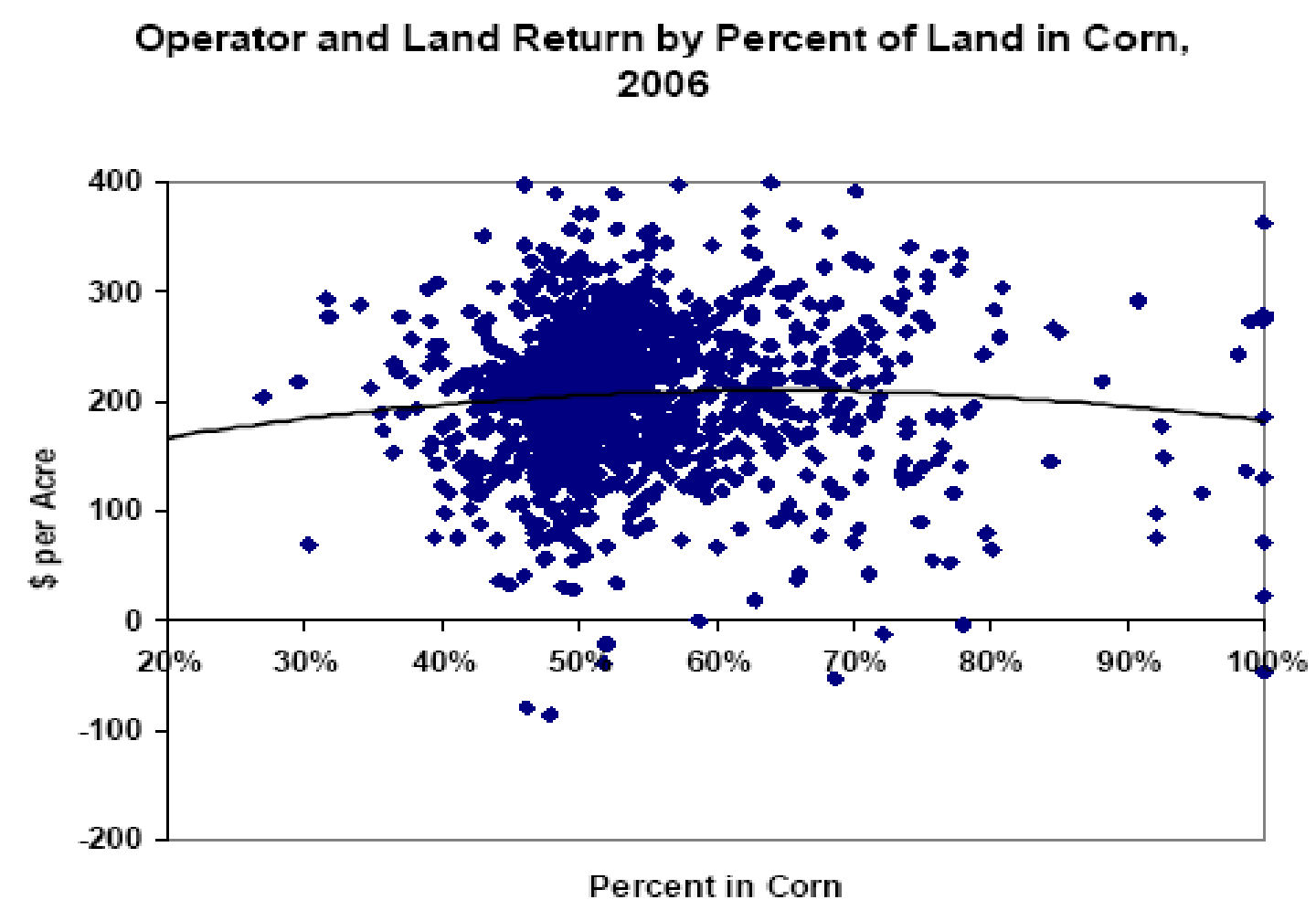
- Can use university budgets or other peoples' estimates of the yields, prices, costs, and net returns to different crops
- Problem: These are usually averages or even guesses
- Reality: Costs and returns vary greatly among farmers
- You want <u>your</u> costs and returns

1996 Data for about 250 Minnesota Corn and Soybean Farmers



Source: K. D. Olson and H. D. Lohano "Will the true cost of production please stand up?"

Illinois Data for 2006



Source: Gary Schnitkey "Crop Production Cost and Rotation Decisions"

Making Budgets

- Make budgets to estimate your net returns for corn after soybeans, plus corn after corn, soybeans, and wheat
- Budgets can be as simple or detailed as you want to make them: you decide
- Estimate your costs and returns, as it is your money, your responsibility, you live with the consequences of your decisions

Wisconsin Resources Available

- My Extension web page
  www.aae.wisc.edu/mitchell/extension.htm
- UW-Team Grains web page
  www.uwex.edu/ces/ag/teams/grains/
- UW Center for Dairy Profitability
  www.cdp.wisc.edu/crop%20enterprise.htm
- Detailed Excel spreadsheets with base cases and then you enter your numbers

Questions?

How to help clients be as profitable as possible? Recommend judicious input use

- Fertilizer is and will be expensive
  - Use soil tests, nutrient crediting and recommended rates to control costs
  - Properly calibrate application equipment or know which applicators do so
  - Forward price fertilizer, especially P
  - Think about on-farm (or in-field?) storage possibilities

Current and future fertilizer prices

Fertilizer	Jan 2008[1]	Feb 2008[2]	Fall 2008
Urea	505	499	
Anhydrous	775	712	750-800
32% N Solution	403	402	
Ammonium Sulfate	240	322	
DAP	578	622	950-1000
Potash	418	516	600

[1]Landmark Services Coop [2]Frontier FS Coop

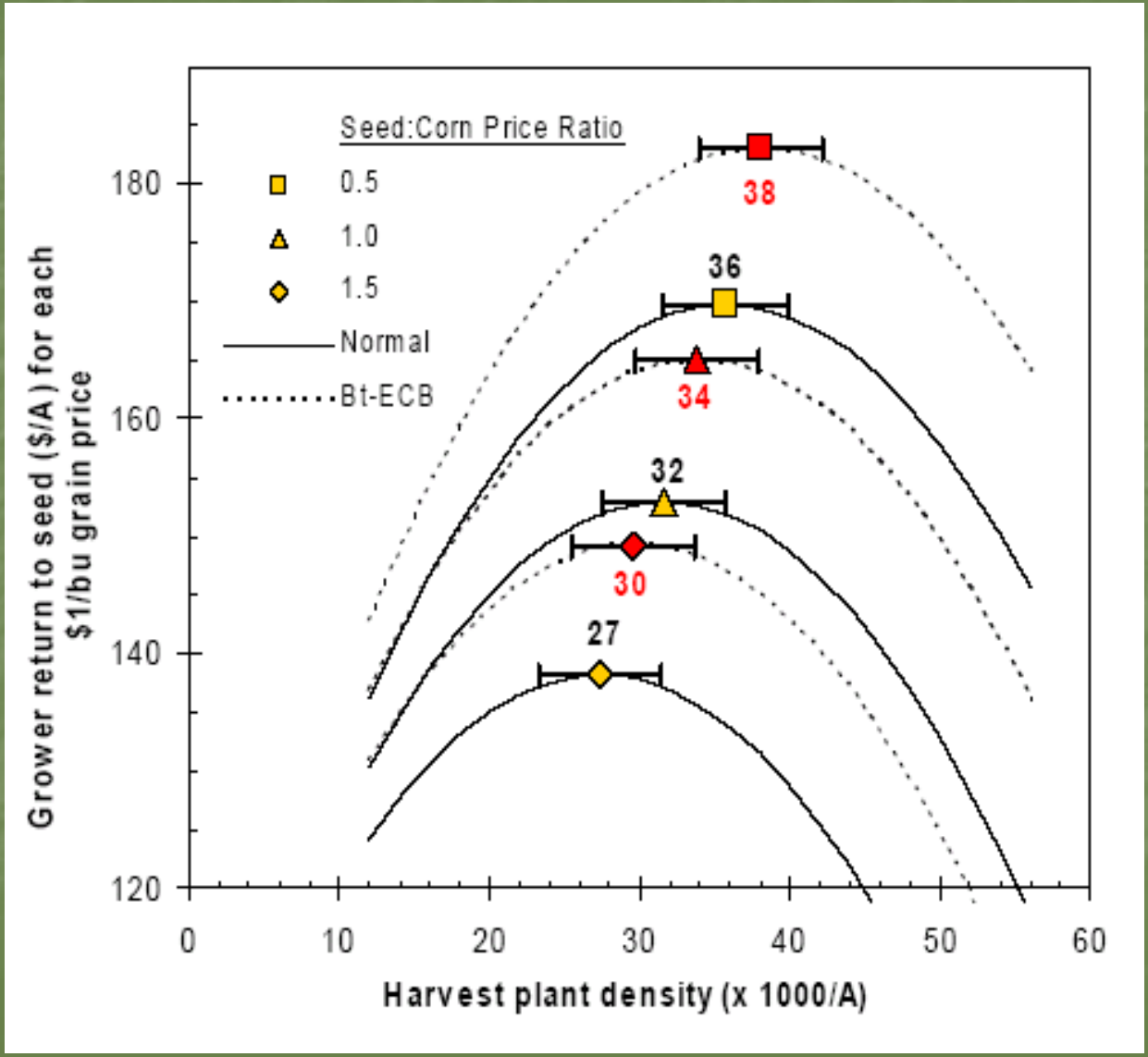
Planting Density for Corn

- See Joe Lauer's recent publications on "Guidelines for Managing Corn Seed Costs"
- Optimal planting densities have increased for newer hybrids and for Bt corn
- http://corn.agronomy.wisc.edu/AA/2006/A044.htm
- Recommended density depends on the corn:seed price ratio and it's higher than most farmers are used to planting
- Maybe try some on farm experiments this year?

Current Corn:Seed Price Ratio

Seed Price		Corn Price ($/bu)					
$/80,000	$/1,000	$3.00	$3.50	$4.00	$4.50	$5.00	$5.50
$40	$0.50	0.17	0.14	0.13	0.11	0.10	0.09
$60	$0.75	0.25	0.21	0.19	0.17	0.15	0.14
$80	$1.00	0.33	0.29	0.25	0.22	0.20	0.18
$100	$1.25	0.42	0.36	0.31	0.28	0.25	0.23
$120	$1.50	0.50	0.43	0.38	0.33	0.30	0.27
$140	$1.75	0.58	0.50	0.44	0.39	0.35	0.32
$160	$2.00	0.67	0.57	0.50	0.44	0.40	0.36
$180	$2.25	0.75	0.64	0.56	0.50	0.45	0.41
$200	$2.50	0.83	0.71	0.63	0.56	0.50	0.45
$220	$2.75	0.92	0.79	0.69	0.61	0.55	0.50

Optimal Harvest Plant Densities



Guidelines for Managing Corn Seed Costs, J. Lauer and T. Stanger. Agronomy Advice, Dec. 2006

Judicious Pesticide Use

- Scout for pests (soybean aphids) and diseases to catch them before losses occur
- Scout weeds, use right herbicides for the weeds they have and control when they are small
- Stay in touch with multiple suppliers on chemical prices and availability
  - Know which chemicals are expensive or in short supply
  - What are the alternatives to help reduce input costs?
  - Who has which chemicals at what cost?

Pesticide Prices and Availability

- Companies ready to sell as much as they can, to take advantage of higher demand
- Supplies and prices could be an issue if we get unexpectedly large demand
  - Fungicides if soybean rust hits hard
  - Insecticides if have soybean aphid explosion
- Specific chemicals have higher prices (roundup, atrazine) or tighter supply due to plant closings
- Applicator/equipment availability maybe more of an issue

Questions?

2008 Crop Insurance Overview

- Overview current crop insurance programs for corn, soybeans and wheat
- Crop Insurance Hints for 2008
- Crop Insurance changes coming

Types of Policies

- APH: Actual Production History
  - Individual Yield Insurance
- CRC: Crop Revenue Coverage
  - Individual Revenue Insurance
- GRP: Group Risk Plan
  - Area-wide (County) Yield Insurance
- GRIP: Group Risk Income Protection
  - Area-wide (County) Revenue Insurance

APH: Actual Production History

- If your harvested yield is less than your yield guarantee, receive an indemnity
- Yield guarantee: average of your actual harvested yields for last 4-10 years
- Coverage Level: Determines yield trigger
  - Choose percentage of your average yield as your guarantee, from 50% to 85% by 5% intervals
- Price Election: Determine price for losses
  - Choose price paid for each bushel below your guarantee, from 100% to 55% of established price

If you observe farmer has a loss

- If you think you farmer has a loss, **farmer should contact his crop insurance agent**
  - Documentation of losses and practices is key
  - Likely leave crop standing for loss adjustment
  - Stalk rot/lodged corn, Aflatoxin a loss
  - Wildlife damage a loss: deer, wild hogs, geese
  - Alternative uses: Be careful before you graze
  - Poor management is not insurable cause of loss
- Lots of rules, don't forfeit indemnities by making a mistake

CRC Crop Revenue Coverage

- Combines APH with price protection based on CBOT futures prices
- Farmers APH yield history and CBOT prices sets preliminary revenue guarantee
- Same coverage level options, same unit structures
- Revenue at harvest is yield x CBOT prices (Nov average of Dec corn)
- If harvest revenue is below guarantee, triggers an indemnity payment

CRC protects against price increases and decreases

- If price falls or have low yield, know will have grain or money to buy grain to fulfill contracts
- If price increases by harvest, revenue guarantee increases too, so again know will have grain or money to buy grain to fulfill contracts
- Can market more aggressively since will have grain or indemnities to buy grain at the existing market prices if have a yield loss
- Careful: are limits to price swings CRC covers

CRC Price Limits

- CRC limits the harvest price swings it covers to no more than $1.50 for corn and $3.00 for soybeans
- Much more likely in 2008 with current high prices and associated volatilities
- Gary Schnitkey, U of IL FarmDOC

  "Impacts of CRC Price Limits on the Value of CRC Relative to RA"

  http://www.farmdoc.uiuc.edu/manage/newsletters/fefo08_04/fefo08_04.html

Corn $5.30/bu base

Price Range	Chance of Price in Range
	Percent
Less than $3.80	14
$3.80 to $4.30	12
$4.30 to $4.80	14
$4.80 to $5.30	13
$5.30 to $5.80	12
$5.80 to $6.30	11
$6.30 to $6.80	7
More than $6.80	17

31% chance

Soybeans $13/bu base

Price Range	Chance of Price in Range
	Percent
Less than $10.00	18
$10.00 to $11,00	11
$11.00 to $12.00	12
$12.00 to $13.00	13
$13.00 to $14.00	10
$14.00 to $15.00	8
$15.00 to $16.00	7
Greater than $16.00	21

39% chance

- If harvest prices move outside the $1.50 or $3.00 range, farmer revenue guarantees will not update enough to buy grain at the prevalent harvest price
- Implication: be more careful with overly aggressive marketing based on CRC revenue guarantees

GRP Group Risk Plan
GRIP Group Risk Income Protection

- GRP = APH, except uses NASS county average yield
- GRIP with **Harvest Revenue Option** is RA, but with NASS county average yield
  - Does not have price swing limits (like RA)
- GRP/GRIP Not available for Wheat in WI
- GRP/GRIP payments not made until Mar/Apr when NASS yields come out

Lots of Crop Insurance Rules

- Rules on: Planting dates, Late/prevented planting, **Double cropping**, Alternative crop uses, **Corn maturity**, Yield guarantees, **Breaking new ground** (CRP vs pasture)
- Be sure you are not recommending practices that violate crop insurance rules
- Insurance agents do not always know all rules
- Call RMA St. Paul regional office 651-290-3304

Questions?

Hints for Using Crop Insurance in 2008

- CRC will be popular again this year
  - Yield Risk: same as it has always been
  - Price Risk: increased with higher volatility
  - Investment Risk: high input costs mean larger investment in planted fields: want more protection against crop failure/loss
- Premiums high in 2008 with high crop prices
- Dairy/Livestock can use CRC indemnities to buy grain at current prices if have a loss

GRIP/GRP

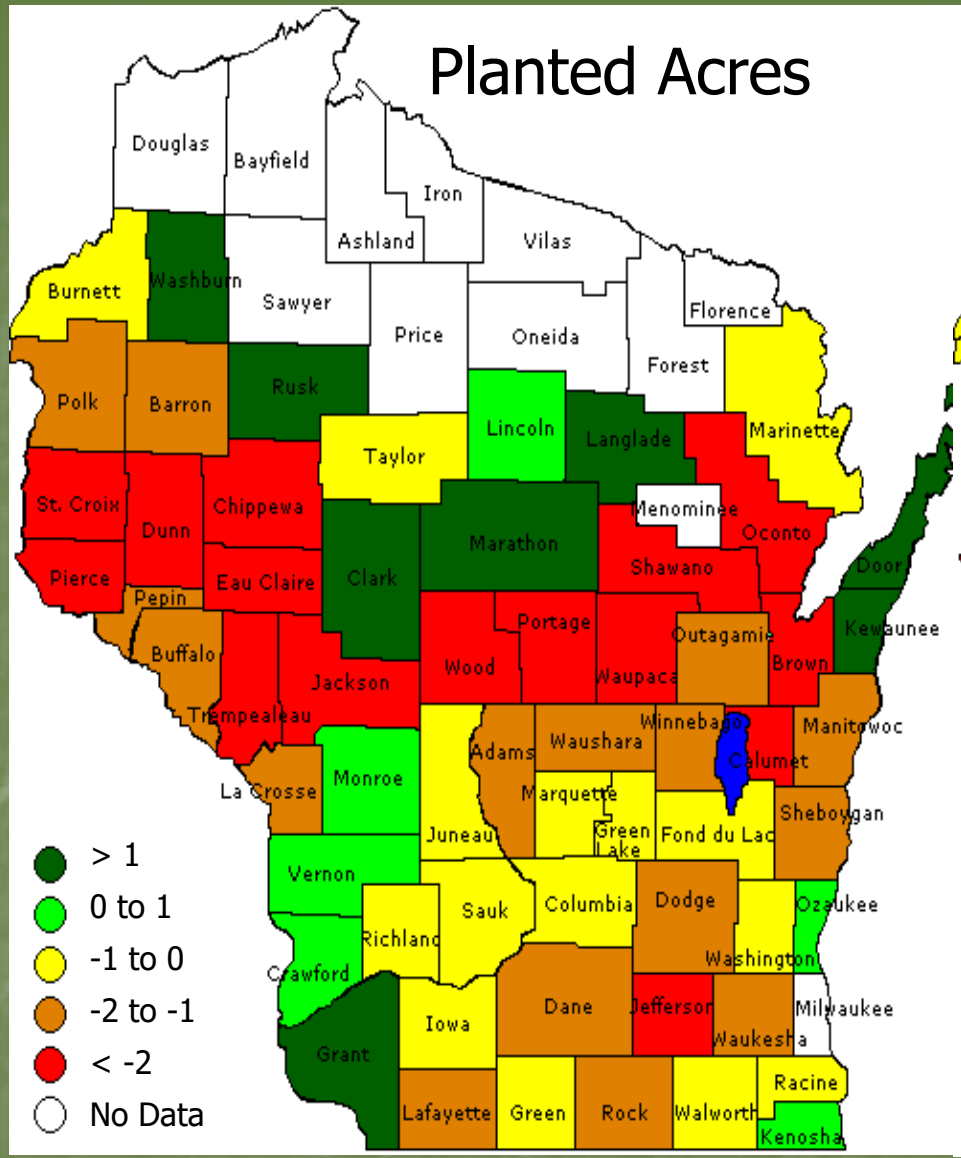
- GRIP popular with large, low risk producers
  - You may have yield histories to help producer see if APH/CRC will be likely to pay for them
  - If unlikely, GRIP may be a good idea for them, to get price protection, some yield protection
  - Download NASS county yield to look at how likely GRP/GRIP to pay
  - See "Is GRP a Good Deal for my corn in 2008?"
- Potentially useful for irrigated farmers
  - Offset irrigation costs in dry years

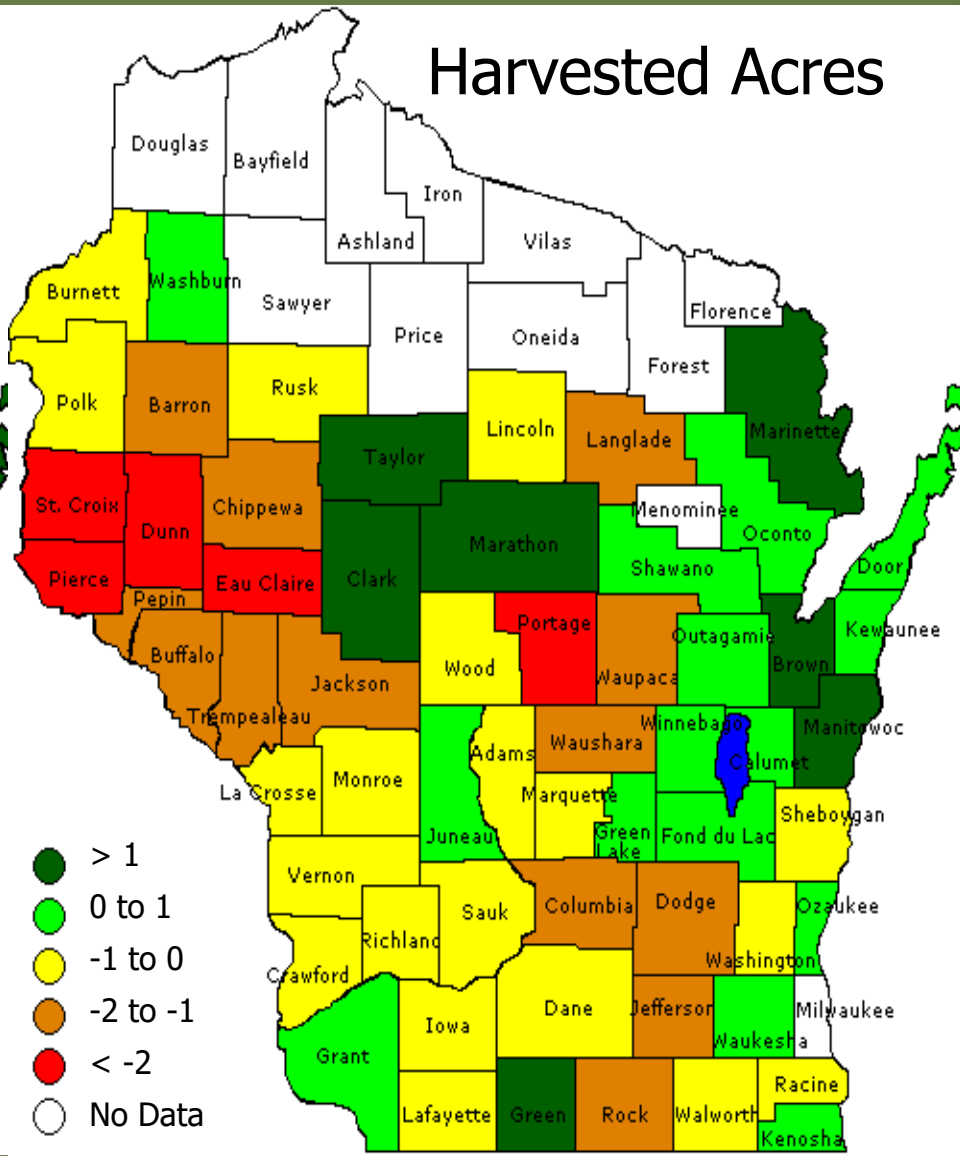
GRP/GRIP for Corn in Wisconsin

- Important issue for Corn: Which county yield do you choose to insure, yield per planted acre or yield per harvested acre?
- Only in Wisconsin is there a choice
- Because of dairy, in years with marginal corn yields, poorer corn chopped for silage
  - Yield per harvested acre can remain high, even though it's a bad year
- Which is better? Depends on the county!

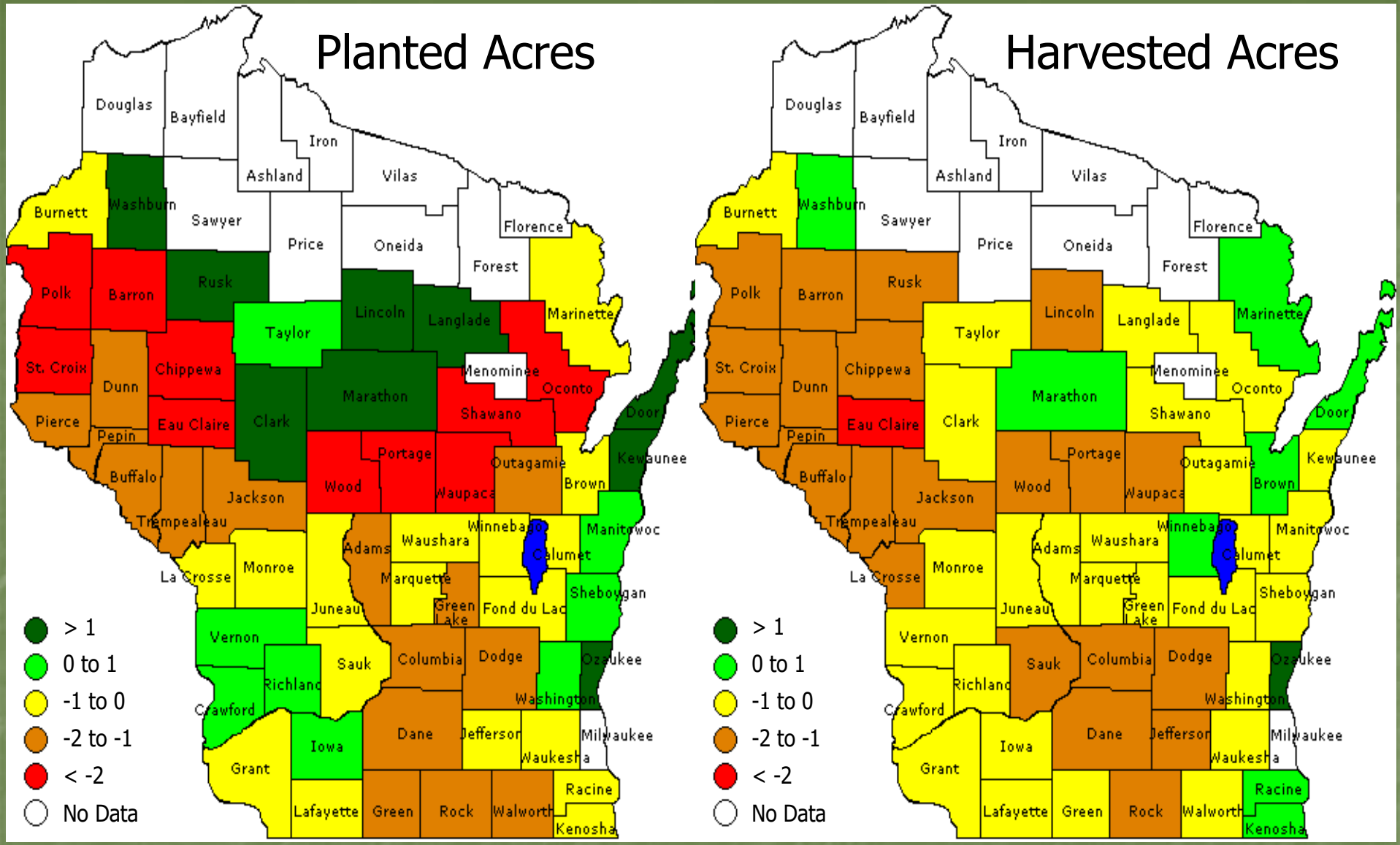
Is GRP a good deal for my Corn and Soybeans?

- Bulletins posted on my webpage (soybeans soon)
- Analyze county yield data and estimate the expected return to GRP in bu/ac for each Wisconsin county that has GRP
- Expected return = long run average net return to GRP if everything constant over many years
- If GRP is valuable for a county, GRIP will be valuable too, as it adds price protection
- If GRP is not valuable for a county, GRIP can still make sense, to get the price protection



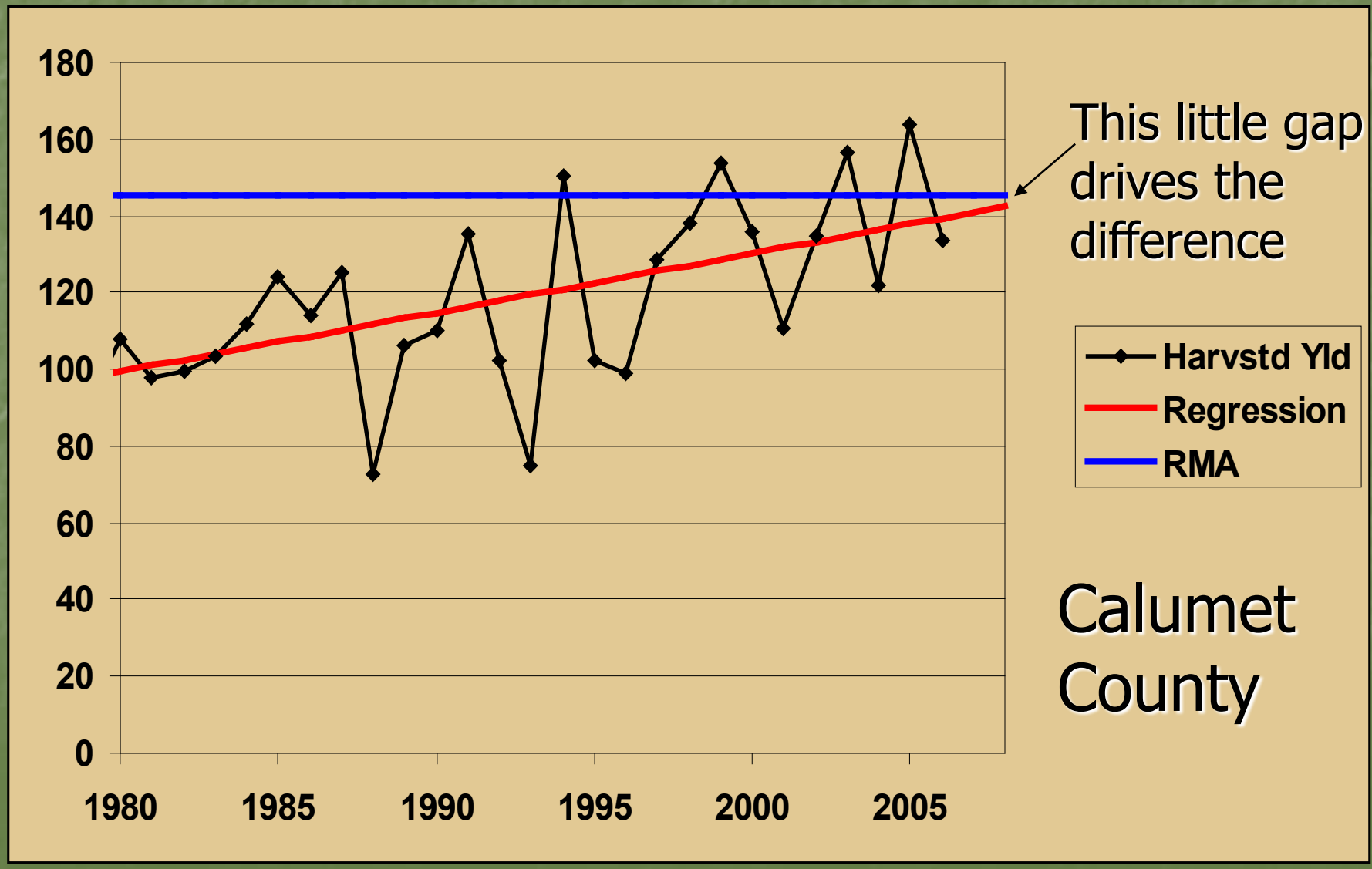


Side-by side comparison (regression yields)

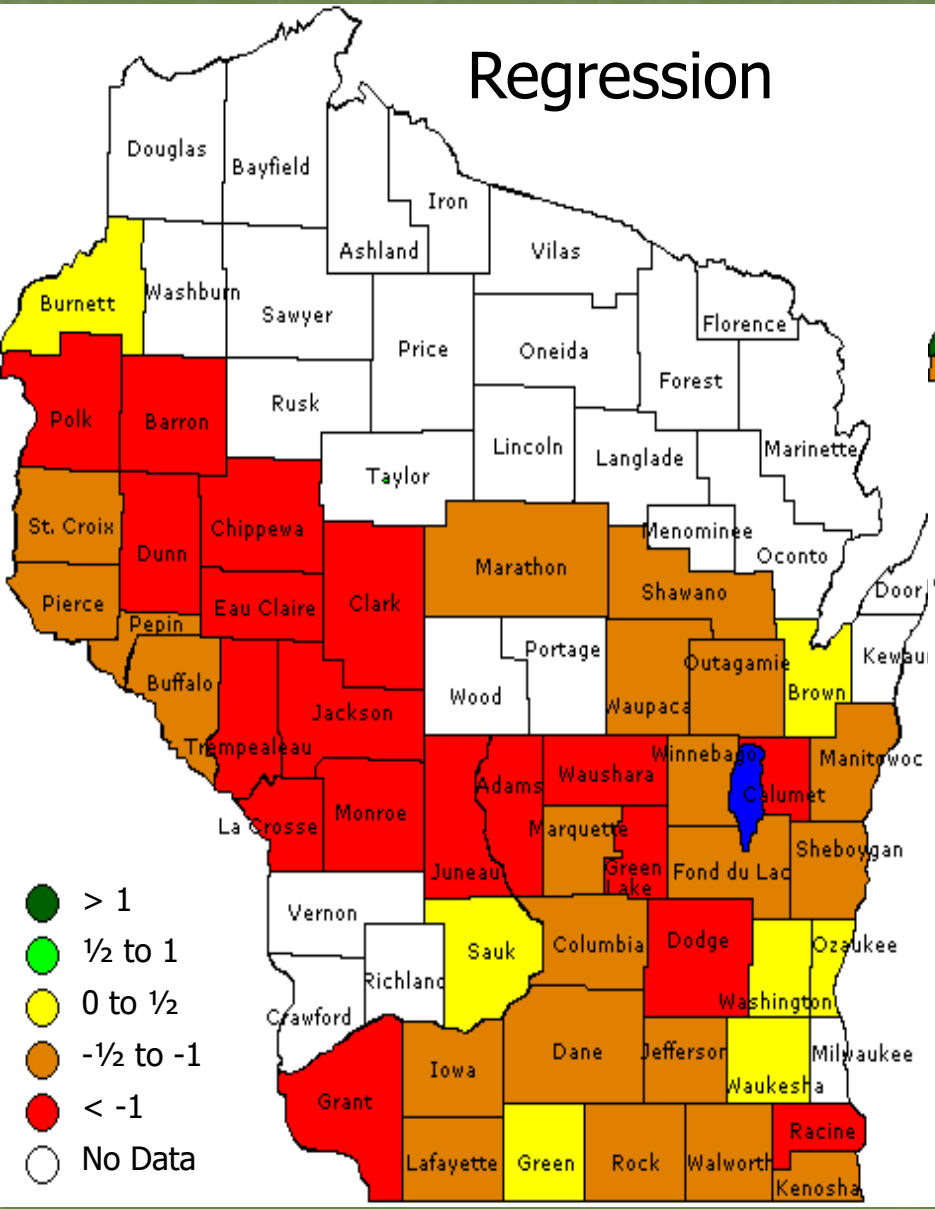


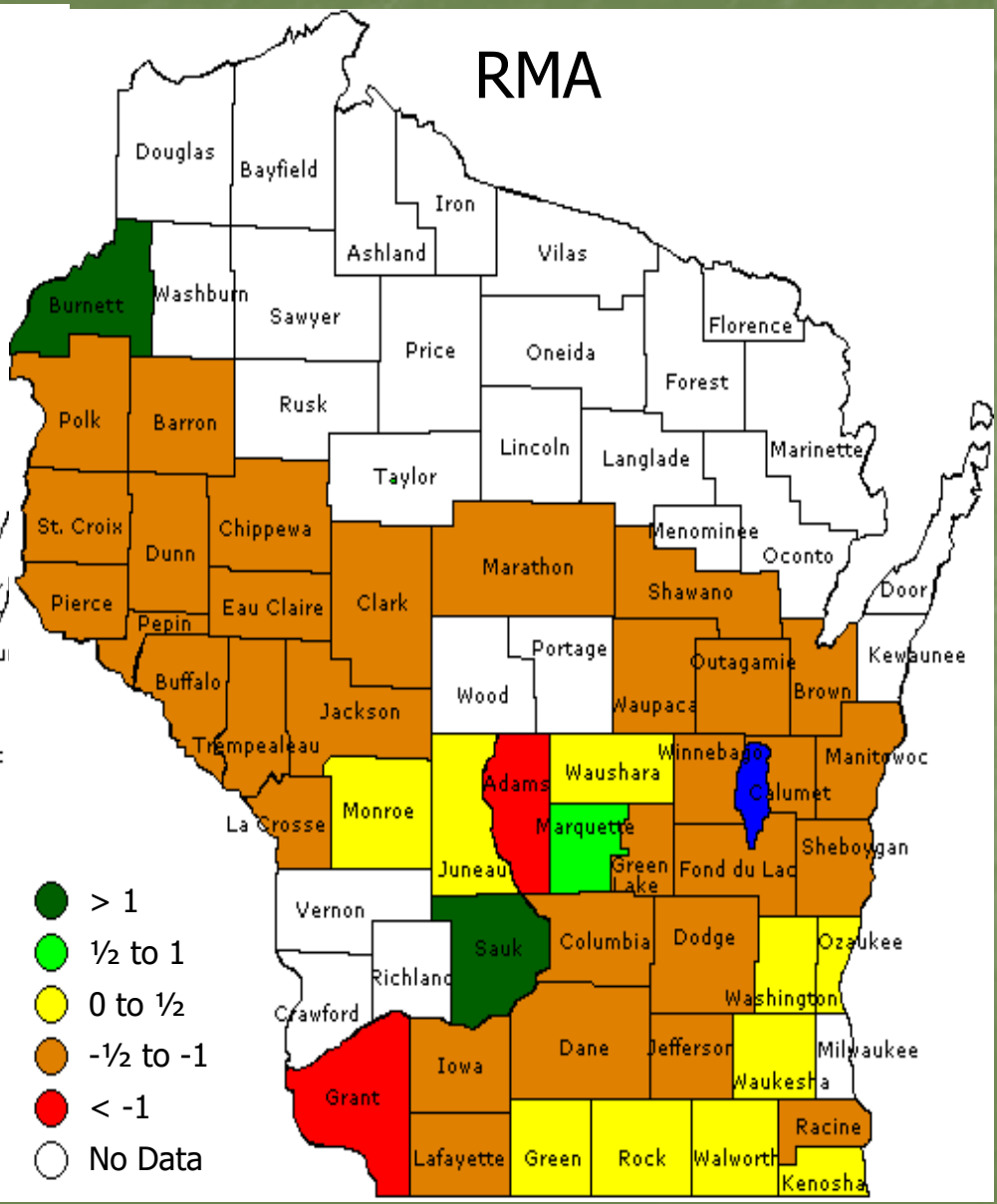
Side-by side comparison (RMA yields)

Regression vs. RMA: What's the difference?



Soybeans: Regression vs. RMA





Crop Insurance Hints

- CRC 65%-75% coverage, 100% price election, with many optional units
- Larger/low risk farms: think GRIP 90% coverage with HRO, using maps to pick acreage option
- Breaking new ground (e.g. pasture), can be given low or no coverage
  - Ask your agent for a **New Breaking Written Agreement** and request a higher yield
  - You could supply data to support request

Crop Insurance Changes Coming

- Biotech Yield Endorsement
  - Approved Sept 12, 2007
  - Available if plant triple stack (Bt CB, Bt RW, RR) on at least 75% of corn
  - Premium reduction for APH/CRC/RA around 20% at the 70%-75% coverage levels
  - Piloted in IA, MN, IL, and IN starting in 2008
  - Expect expansion to WI if proves popular and actuarially sound

Crop Insurance Changes Coming

- Combo Policy: Released in 2009
  - One basic policy with multiple options
  - Combines APH, CRC/RA, GRP, GRIP
  - No longer sell APH, CRC, RA, GRP, GRIP, IP
  - **Will mean RA-like policy for WI (finally)**
- AGR-Lite and AGR combined into AGRI
  - Whole farm revenue insurance that can combine with crop-specific policies
  - Released in 2010

Questions?

Paul D. Mitchell
UW-Madison Ag & Applied Economics
Office: (608) 265-6514
Cell: (608) 320-1162
Email: pdmitchell@wisc.edu
Extension Web Page:
www.aae.wisc.edu/mitchell/extension.htm