

No Barley, No Beer: Strategies and Risks in Producing Quality Malting Barley.

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March 2016



Great Lakes Hop and Beer Conference
March 16 & 17, 2016
Traverse City, Michigan



NO BARLEY

NO BEER



Malting Barley Risk Management Strategies - Overview

□ Crop Production Practices.

- Planting through harvest.
- Impact of management decisions on malt barley quality.
- Environmental concerns.

□ Business Management Practices.

- Producing malting barley under contract.
- Crop insurance.

□ Malting Barley Outlook.

- Concentration of production.
 - Maintaining a steady source of supply in the United States.
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Crop Production Practices: Growing Malting Barley

- North Dakota barley grower perspective.
 - Production practices.
 - Planting.
 - Weed control.
 - Soil fertilization.
 - Disease management.
 - Harvesting.
 - Storage.
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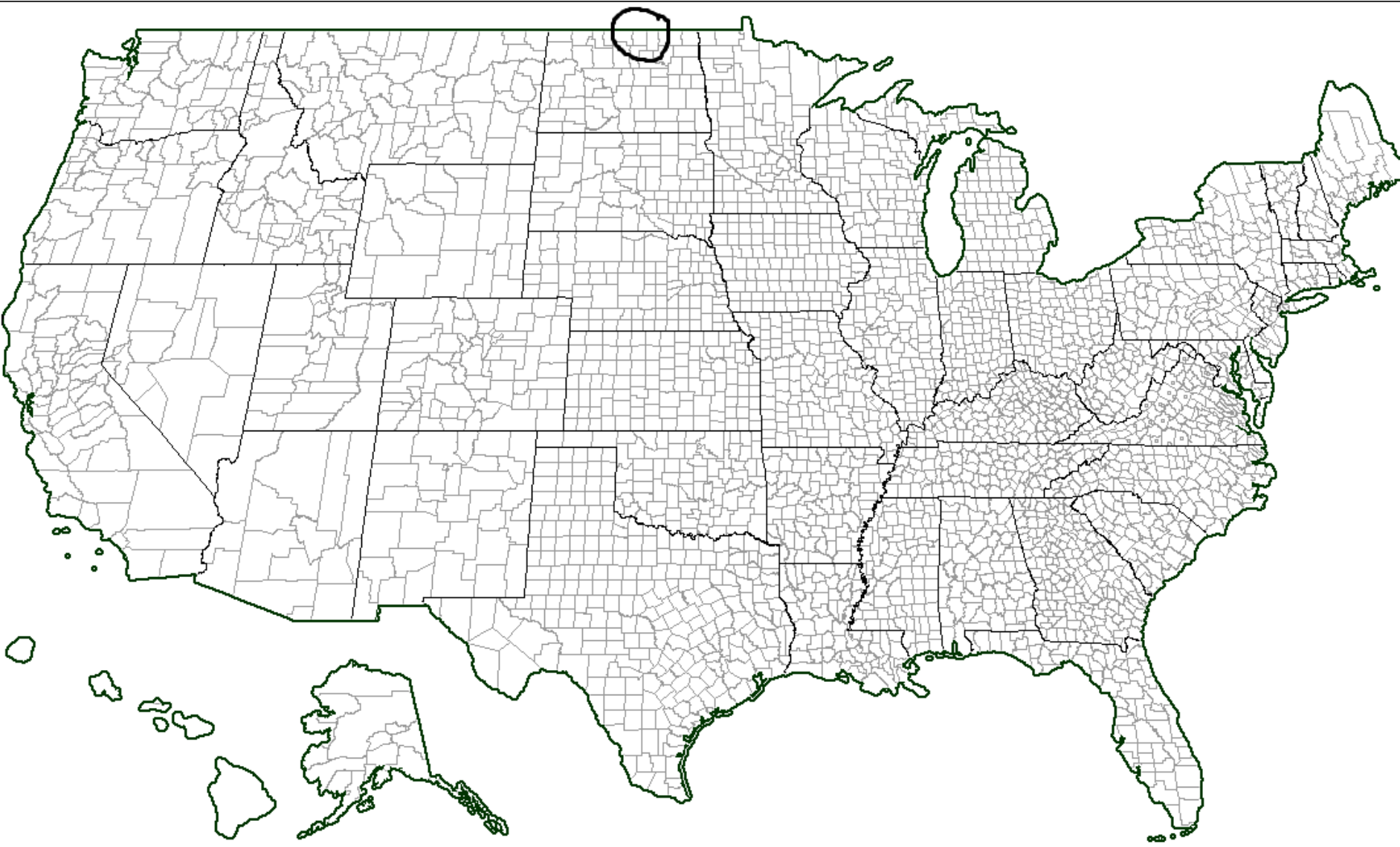
The North Dakota Barley Grower

- ❑ Area planted in ND: 1,120,000 Acres in 2015 (source: USDA-NASS)
 - ❑ Number of growers: approximately 4,700 (source: USDA-FSA).
 - ❑ Average acres per grower: approximately 238.
 - ❑ Range: 150 acres to 4,000 acres.
 - ❑ Other crops: corn, soybeans, wheat, canola, flax, lentils, sunflowers, etc.
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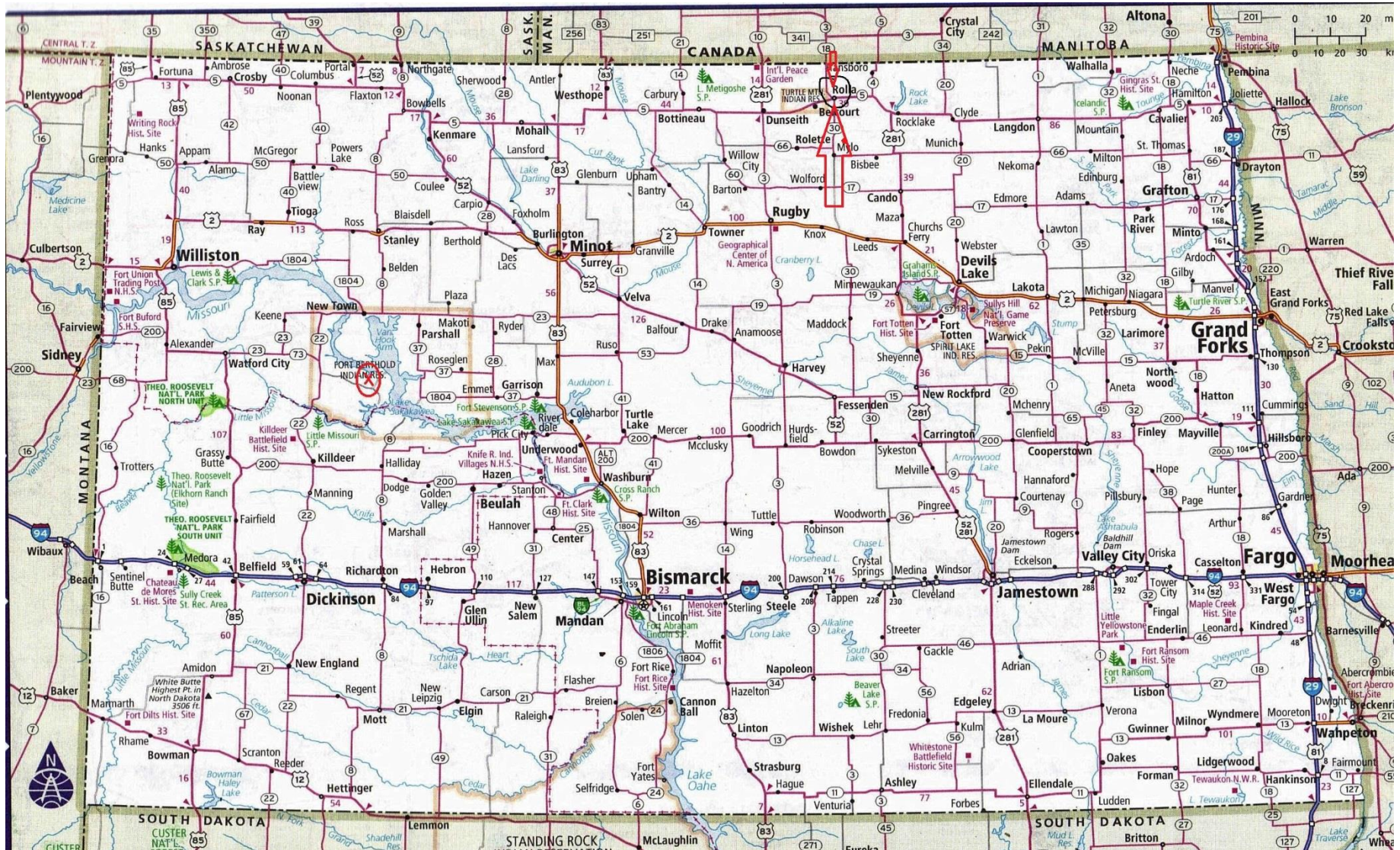
Barley Basics

- Test weight (bulk density)
 - 48 lbs/bu.
 - 60 kg/hl.
 - Average yield in North Dakota
 - 57 bushels per acre (USDA NASS 15 year average).
 - Average production per grower
 - $238 \text{ acres} \times 57 \text{ bu/ac} = 13,566 \text{ bushels}$
(Approximately 17 semi-truck loads)
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Lentz Farm – North Central North Dakota.



Lentz Farm – North Central North Dakota.



Planting Malting Barley

- Date: early April to mid-May.
 - Rate:
 - 1.5 to 2.0 bushels per acre.
 - 65 to 90 pounds of pure live seed per acre.
 - A bushel weighs 48 pounds.
 - Target plant population 1.25 to 1.30 million plants per acre.
 - Depth: 1 to 2 inches.
 - Barley contains approximately 14,000 seeds per pound.
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Planting Barley Using an Air Seeder



Weed Control

- ❑ Barley is not “Roundup Ready”.
 - ❑ There are numerous weed control options available.
 - Older chemistry: 2,4-D, MCPA, Dicamba.
 - Newer products: Widematch.
 - ❑ Typically spray for weeds prior to 5 and ½ leaf stage to prevent crop damage.
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Soil Fertility for Malting Barley

□ Nitrogen (N).

- Approximately 1.25 to 1.50 pounds of nitrogen per bushel of yield per acre.
 - 80 bushel per acre barley crop requires approximately 100 to 120 pounds of actual nitrogen per acre.
 - Heavy soils, lower rate of ND.
 - Too much nitrogen = too much protein, and can cause lodging.
 - Protein \leq 13.5% is the target.
 - Some maltsters have narrowed the range (e. g. 11.5% to 13.0%).
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Soil Fertility (cont'd)

□ Phosphorous (P).

- Starter fertilizer at planting is a common practice.

- DAP: 18-46-0.

- MAP: 10-50-0.

- Rates: 40 to 80 pounds per acre.

□ Potassium (K).

- Research has shown K to improve barley straw strength and reduce lodging.
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Disease Management

- Fusarium Head Blight (FHB).
 - Also known as “scab”.
 - Affects barley during anthesis (flowering).
 - Causes kernels to become pink and “chalky”.
 - Reduces germination.
 - Results in beer “gushing”.
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FHB in Barley



Disease Management (cont'd)

- Fusarium Head Blight (scab)
 - Corn harbors the fusarium fungus.
 - Barley in rotation with corn is problematic.
 - Spraying for scab.
 - Two applications (boot stage and heading).
 - Prosaro is a typically utilized fungicide in the Northern Plains.
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Harvesting

- Historically, barley was harvested via a two step process:
 - A windrower (swather) placed the barley in row.
 - Prevented additional lodging.
 - Barley has poor straw strength.
 - Harvest was completed with a pickup header on the combine.
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Swathing Barley



Using a Pickup Attachment



Straight Harvesting – More Prevalent



Harvesting Barley

- Barley is the only crop that must be delivered in a “living state”.
 - The seed must be harvested in a condition to achieve germination for malting.
 - Combine settings are important.
 - Cylinder speed.
 - Reel speed.
 - Concave position.
 - Fan speed.
 - Top chaffer.
 - Bottom sieve.
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Setting the Combine



Storing Malting Barley.

- Drying.
 - Malting barley can be dried prior to storage.
 - Temperature control is critical to prevent germination damage.
 - Storage moisture.
 - Should be less than 13.5%.
 - Grain bin aeration is beneficial.
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Malting Barley Varieties

- 6 Row
 - Tradition
 - Quest
 - 2 Row
 - Pinnacle
 - Genesis
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THE GROWER QUESTION

- Why should I grow malting barley?



COMPENSATION

- ❑ Malting barley must generate profit.
 - ❑ The ND Barley Council utilized a grower focus group to outline crop selection decision factors.
 - ❑ Two general factors in crop selection.
 - Crop quality factors.
 - Crop business management factors.
 - ❑ Growers scored each of these factors.
 - Score of "1" (green): easy to achieve.
 - Score of "2" (orange): more difficult and requires more management.
 - Score of "3" (red): very difficult and requires considerable skill and management.
 - ❑ Developed a "heat map" matrix.
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Barley Production in North Dakota

- Planted area allocation of barley.
 - Malting Varieties: 90%
 - Feed Varieties: 10%
 - Reasons for production decline.
 - Numerous crop choices.
 - Loss of feed barley export markets.
 - Downside risk of selling feed barley.
 - Ease of selling corn, soybeans, wheat.
 - Lending institution limitations.
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Crop Quality Factors

- Corn and soybeans.
 - Test weight (bulk density) and moisture content.
 - Malting barley.
 - Bulk density, germination, mycotoxins, plump kernels, protein, heat damage, frost damage, sprout damage, moisture.
 - Malting barley is the only crop that must be delivered in a “living state”.
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EXAMPLE SPECIFICATIONS FOR MALTING BARLEY

QUALITY FACTOR	LIMIT	2 ROW	6 ROW
Color	NA	Uniform bright or light gold	Uniform bright or light gold
Moisture	Maximum	13.50%	13.50%
Protein (dry basis)	Maximum	13.50%	13.50%
Skinned and Broken	Maximum	6%	8%
Germination	Minimum	96%	96%
Mold	Maximum	5%	5%
Blight	Maximum	4%	4%
Dockage	Maximum	0.50%	0%
Wild Oats	Maximum	1%	1%
Extraneous Materials	Maximum	2%	2%
Sprout Damage	Maximum	1%	1%
DON (caused by scab)	Maximum	1.0 PPM	1.0 PPM
Thin kernels	Maximum	10% through 5.5/64 by 3/4 screen	5% through 5/64 by 3/4 screen
Plump kernels	Minimum	75% remaining on 6/64 by 3/4 screen	70% remaining on 6/64 by 3/4 screen

Notes regarding specifications for 2 Row and 6 Row Malting Barley

- Free of musty and other objectionable odors.
- Dockage is defined as material passing through and 8/64 triangle screen, and all other foreign material.
- Extraneous materials are any combination of other barley varieties, other grains, foreign material, and immature / green kernels totaling 2% maximum.
- All barley must be delivered in a cool, sweet condition and shall be free of heat or frost damage, ergot, smut, and other contamination, including, but not limited to animal filth, birds, and insects.

Crop Business Management Factors

- ❑ Corn and soybeans.
 - Easy to market, sell, and receive prompt payment.
 - ❑ Malting barley business challenges.
 - May need to store barley on farm for months.
 - ❑ Maintain malting barley integrity.
 - ❑ Impacts cash flow for the farm business.
 - Requires more management time.
 - ❑ Barley fields must be continuously monitored for weed control, disease control, harvest timing, etc.
 - Crop insurance historically based on feed barley, not malting barley.
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Heat Map – Quality Factors

		HARD RED	MALTING		
FACTORS	UNITS	SPRING WHEAT	BARLEY	CORN	SOYBEANS
Crop Quality Factors					
--Falling Numbers	seconds	1	1	1	1
--Test weight (bulk density)	lbs/bu	1	1	1	1
--Protein	%	1	2	1	1
--Moisture	%	1	2	1	1
--Germination	%	1	2	1	1
--Mold in seed crease	visual	1	3	1	1
--Deoxynavalenol (DON)	ppm	2	2	1	1
--Heat damage	%	1	2	1	1
--Frost damage	%	1	2	1	1
--Sprout damage	%	1	2	1	1
--Color	visual	1	2	1	1
--Plump Kernels	%	1	2	1	1
TOTAL SCORE FOR QUALITY:		13	23	12	12

Heat Map: Business Management

Crop Business Management Factors	UNITS	HARD RED	MALTING	CORN	SOYBEANS
		SPRING WHEAT	BARLEY		
--Gross margin	\$/acre	1	1	1	1
--Storage on farm	NA	1	3	1	1
--Storage payments for on farm	\$/bu	1	2	1	1
--Price transparency	NA	1	2	1	1
--Receipt of payment	Days	1	3	1	1
--Banker support	NA	1	3	1	1
--Crop insurance coverage	\$/acre	1	3	1	1
--Crop management intensity	NA	1	3	1	1
TOTAL SCORE FOR BUSINESS FACTORS:		8	20	8	8
TOTAL SCORE:		21	43	20	20

Downside Risk Example

- ❑ Yield: 100 bushels per acre.
 - ❑ Malt Barley Price: \$5.00 per bushel
 - ❑ Feed Barley Price: \$3.00 per bushel
 - ❑ Gross Revenue Comparison
 - $100 \text{ bu/ac} \times \$5.00/\text{bu} = \$500.00 \text{ per acre.}$
 - $100 \text{ bu/ac} \times \$3.00/\text{bu} = \$300.00 \text{ per acre.}$
 - Difference between malt and feed: \$200.00 per acre.
 - Downside risk is the probability of not achieving malt and thus selling at a price that cannot provide sufficient profitability (and likely will result in a loss).
 - Can the grower afford to risk \$200.00 per acre.
 - ❑ On 1000 acres, this is \$200,000.00.
 - Buyers: would you accept this risk as an ingredient supplier?
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PROCUREMENT - CONTRACTING

- Malting barley contracting programs provide many benefits to buyers and growers.
 - Secure a base of production.
 - Minimize volatility in purchasing.
 - Developing long term business relationships with growers.
 - Spread risk.
 - Malting barley must be procured as an ingredient, not traded as a commodity.
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PROCUREMENT - CONTRACTING

- ❑ Malting barley is a “specialty crop” produced under contract.
 - ❑ Buyers have implemented new strategies to purchase malting barley (i. e. contracting production with growers).
 - ❑ Contract components include but are not limited to:
 - ❑ Area produced (acres, hectares).
 - ❑ Quantity produced (bushels, tons).
 - ❑ Price and terms of payment.
 - ❑ Best management practices (planting, fertilizer, etc.).
 - ❑ Storage and delivery (when and where).
 - ❑ Quality specifications (plump, protein, germination).
 - ❑ Act of God (Force Majeure).
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CROP INSURANCE

- A new crop insurance product for malting barley in 2016.
 - It is called Malt Barley Endorsement (MBE).
 - Pilot program.
 - Submitted to USDA Risk Management Agency (RMA) by ND Barley Council and Watts and Associates (a private insurance developer).
 - Insures malting barley based upon malting industry purchasing practices (quality parameters).
 - Cooperative effort between growers, industry, and crop insurance.
 - Data for rating was provided by the malting industry.
 - Crop insurance is vital for risk management and securing production.
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Malt Barley Endorsement Crop Insurance Highlights

- Insured must have at least one eligible contract.
 - Malting barley contract, malting barley price agreement, malting barley seed contract.
 - MBE simply provides additional quality protection for malting barley acreage that is insured under the Small Grains Crop Provisions.
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MBE Insurance Highlights (cont'd)

- ❑ Rejection of any production by the buyer for failure to meet the standards contained in a malting barley contract is an insured cause of loss provided said failure is due to an insurable cause as specified in the Small Grains Crop Provisions.
 - ❑ Grower is insured for quality as outlined in the production contract.
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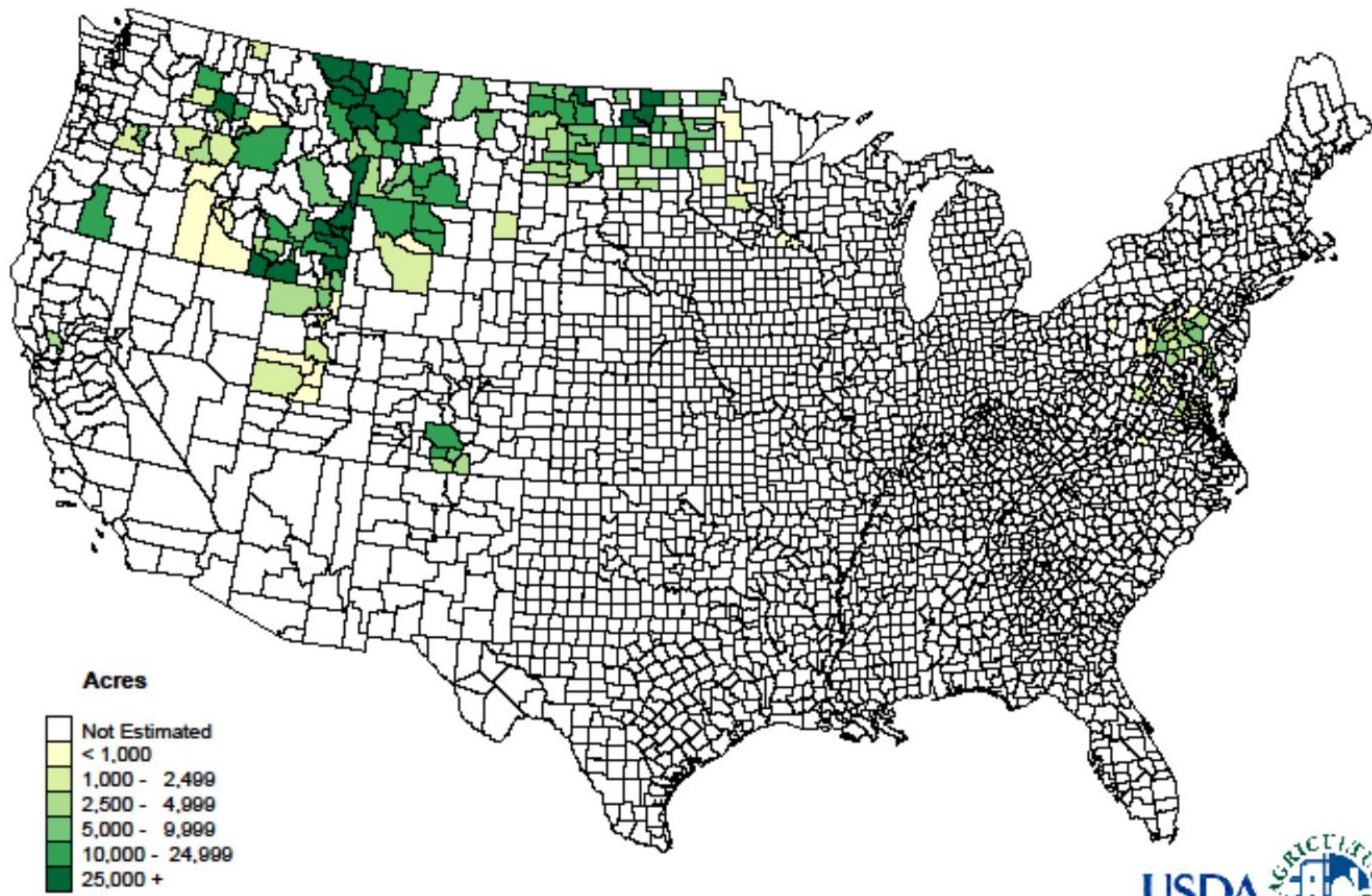
MBE Insurance Highlights

- Additional information available at www.rma.usda.gov.
 - Is not available in Michigan during the pilot period.
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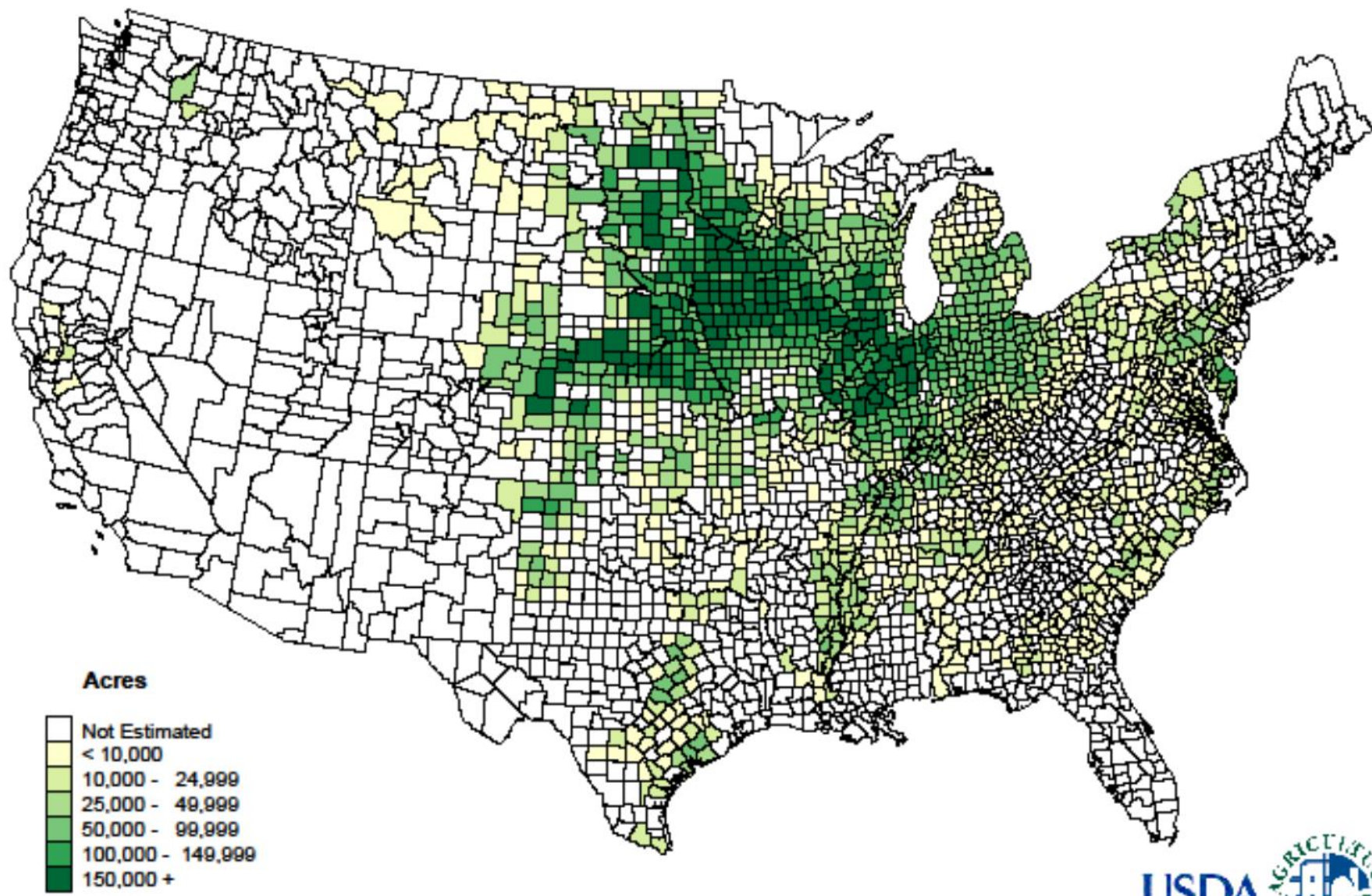
Malting Barley Outlook

- Acreage concentration.
 - North Dakota, Montana, and Idaho.
 - Approximately 70% of U. S. production.
 - Marketing will be largely conducted through contracting programs.
 - Corn and soybeans will continue to pressure malting barley production.
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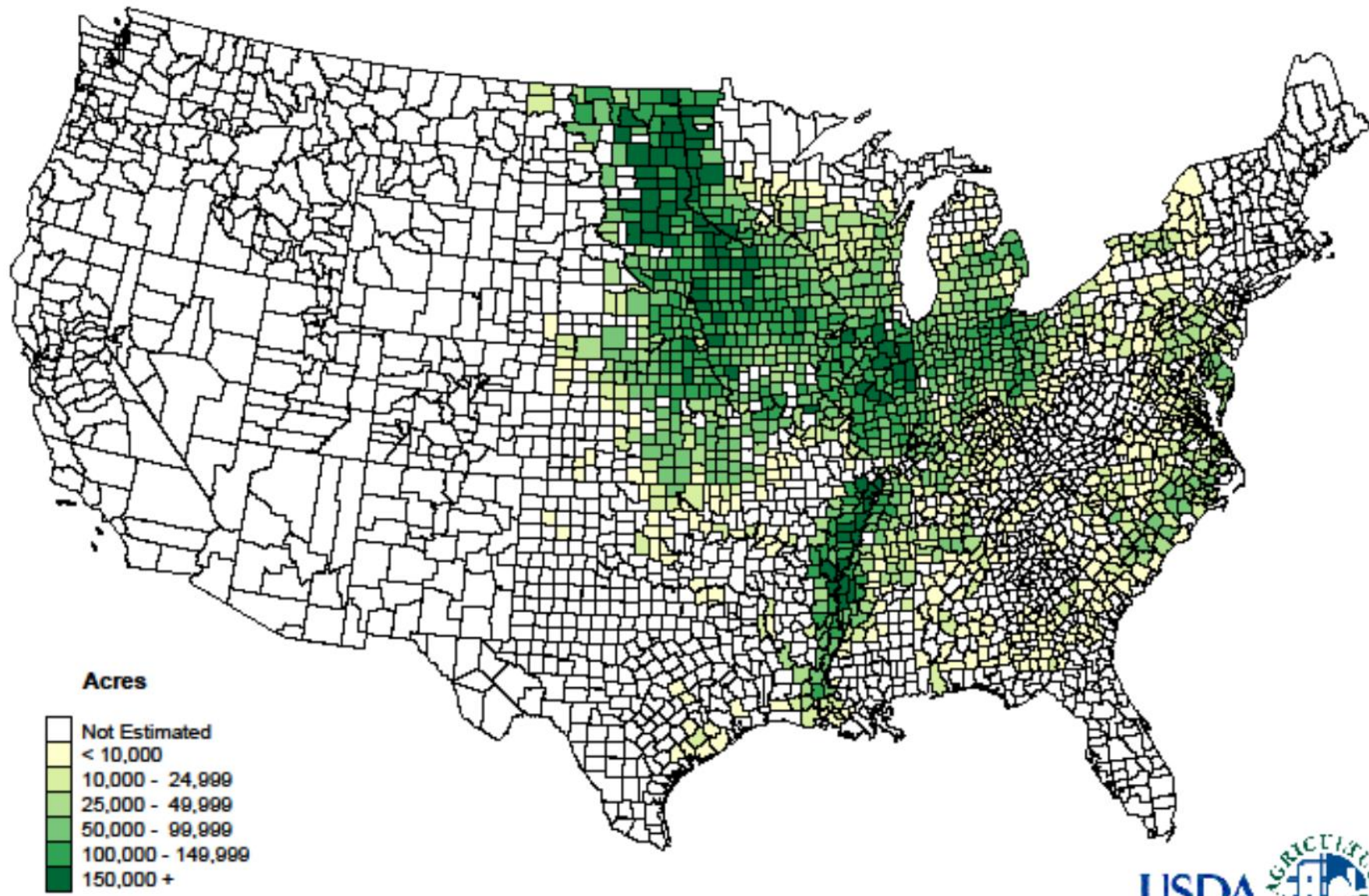
Barley 2014 Harvested Acres by County for Selected States



Corn for Grain 2014 Harvested Acres by County for Selected States

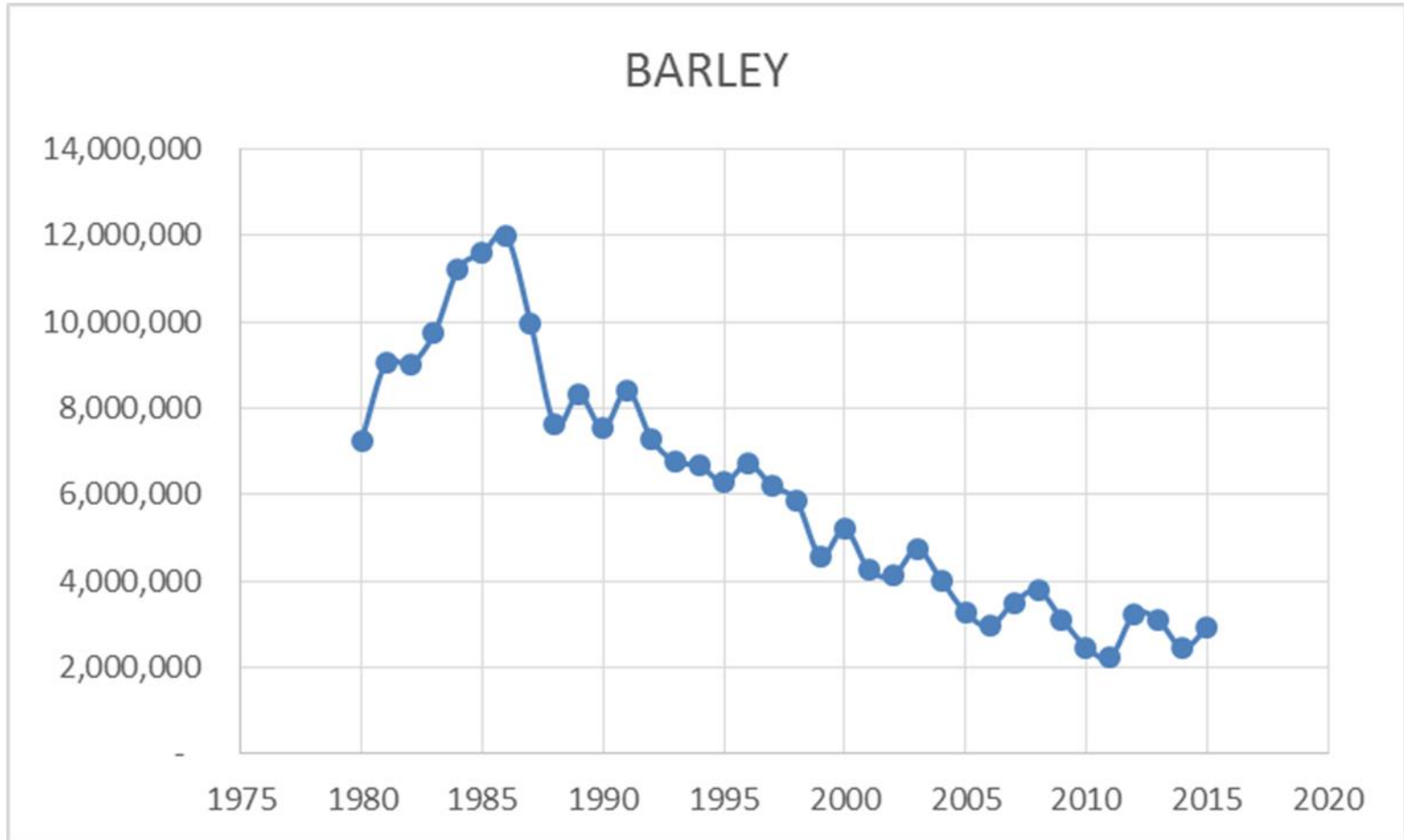


Soybeans 2014 Harvested Acres by County for Selected States



U. S. AREA PLANTED TO BARLEY

(Source: USDA-NASS, 1983 – 2015)



Loss of 310,000 acres per year since 1987.

The Barley Situation (USDA-NASS Area Planted)

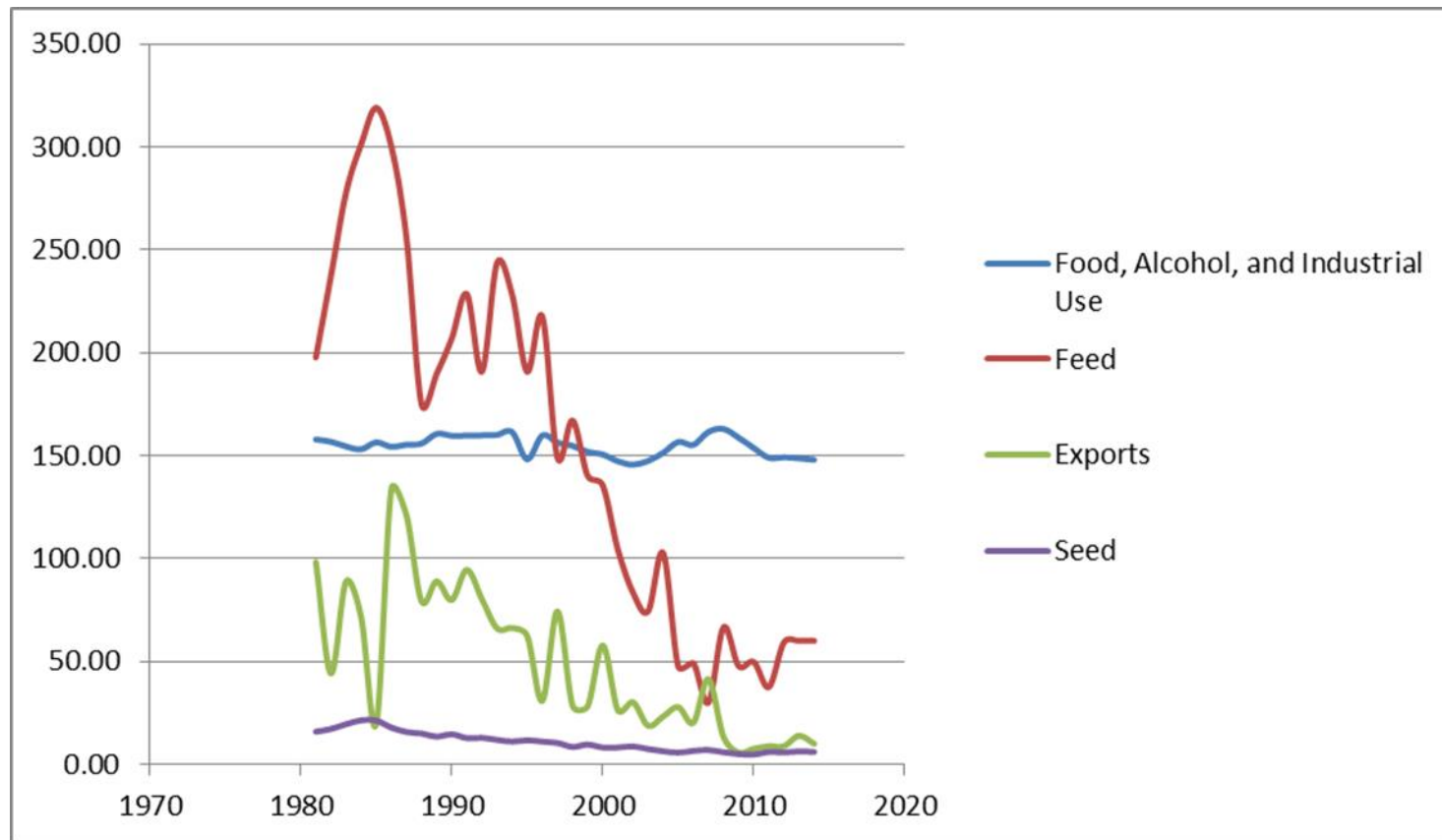
Area Planted (Acres)					Percent Change From 2014 to 2015
STATE	2012	2013	2014	2015	
Idaho	610,000	650,000	560,000	580,000	4%
Maryland	60,000	75,000	70,000	50,000	-29%
Minnesota	115,000	90,000	75,000	135,000	80%
Montana	900,000	990,000	920,000	970,000	5%
North Dakota	1,060,000	760,000	620,000	1,120,000	81%
Oregon	56,000	63,000	40,000	49,000	23%
Washington	185,000	205,000	115,000	110,000	-4%
	2,986,000	2,833,000	2,400,000	3,014,000	
United States:	3,637,000	3,528,000	3,031,000	3,558,000	17%

The Barley Situation

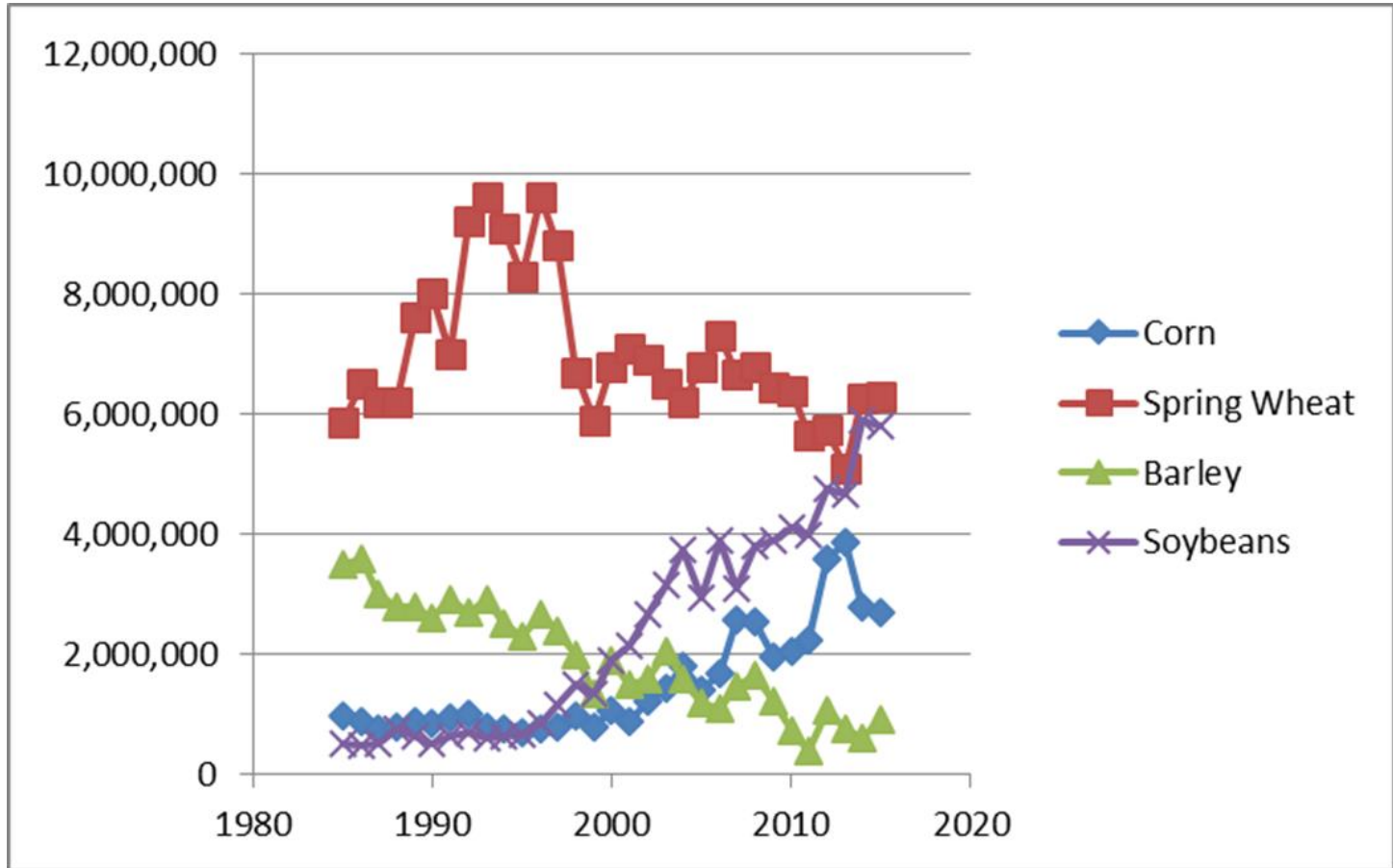
Production (USDA-NASS)

					Percent Change From
Production (Bushels)					
STATE	2012	2013	2014	2015	2014 to 2015
Idaho	53,690,000	57,660,000	51,700,000	53,350,000	3%
Maryland	3,280,000	4,420,000	3,465,000	2,415,000	-30%
Minnesota	5,700,000	5,175,000	3,120,000	9,240,000	196%
Montana	41,870,000	43,160,000	44,660,000	44,200,000	-1%
North Dakota	61,610,000	46,080,000	35,845,000	67,200,000	87%
Oregon	3,816,000	3,500,000	1,900,000	1,924,000	1%
Washington	12,600,000	14,040,000	6,300,000	4,800,000	-24%
Totals:	182,566,000	174,035,000	146,990,000	183,129,000	
United States	220,284,000	216,745,000	181,542,000	214,297,000	18%
North Dakota:	33.75%	26.48%	24.39%	36.70%	
NBGA Member Percentage:	83%	80%	81%	85%	

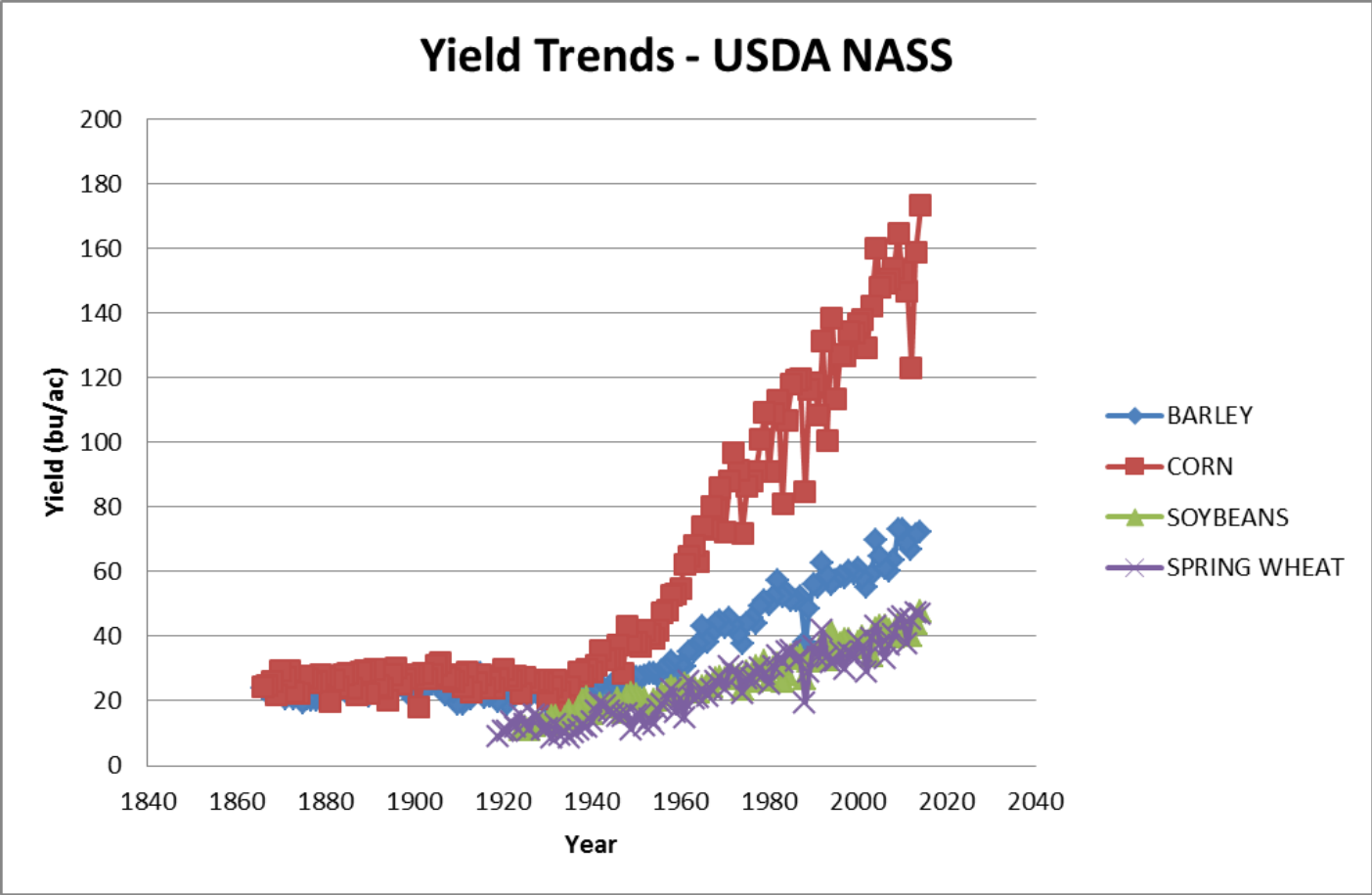
Trends in Barley Utilization and Distribution in the U. S. Million Bushels – USDA-ERS Feed Grains Database 1981 - 2014



Trends in area planted to barley and competing crops in North Dakota (Acres: USDA-NASS 1985-2015)



More Research is Needed to Keep Barley Competitive With Corn and Soybeans (Data Source: USDA-NASS – National Averages)




Craft Beers

- ❑ Craft brewers are seeking to reach 20% market share in the U. S. by the year 2020.
 - ❑ Craft beers have been growing by 12% per year for the past 10 years.
 - ❑ Craft malt usage is 3.4 times the amount of malt used by volume brewers.
 - ❑ Approaching 30% of the U. S. malt market.
 - ❑ Significant area of market growth.
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Summary Comments

- Malting barley is a viable crop in North Dakota and the U. S.
 - Producers are willing to raise malting barley provided that it:
 - Is profitable in comparison to corn, soybeans, wheat, and other crops.
 - Receives appropriate crop insurance.
 - Provides an acceptable risk/reward scenario.
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NO BARLEY
NO BEER

THANK YOU



Follow-Up Education

- The North Dakota Barley Council can provide follow-up education on malting barley.
 - Crop enterprise analysis (production costs & returns).
 - Contracting production with growers.
 - Crop insurance.
 - Comparative risk evaluation with other crops.
 - For further information

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