U.S. Barley Market Trends and Planting Expectations
美国大麦市场趋势及种植预期

China Barley Webinar
May 17, 2022

Nathan Boll, Barley Sector Director
U. S. Grains Council
Nathan Boll 美国谷物协会 大麦董事

U.S. GRAINS COUNCIL

NO BARLEY NO BEER

NORTH DAKOTA Barley

Introduction 介绍

- Married with 2 Children 已婚，有两个孩子
- Own and operate a small grain farm in North Central North Dakota that covers 10,000 acres 在北达科他州中北部拥有和经营一个占地 10,000 英亩的小型谷物农场
- 3rd Generation Farmer 第三代农民
- Recently elected as Barley Sector Director for US Grains Council as well as Chairman for the North Dakota Barley Council 最近当选为美国谷物协会大麦董事和北达科他州大麦协会主席

Nathan Boll Farm, Newburg, North Dakota. (USA)
Nathan Boll农场，纽堡，北达科他州（美国）

NORTH DAKOTA Barley

Nathan Boll Farm, Newburg, North Dakota
Nathan Boll农场，纽堡，北达科他州

- Located near the U. S. border with Canada.位于美国和加拿大边境附近
- Crops produced.种植的作物
  - Spring wheat, barley, canola, soybeans. 春小麦、大麦、油菜、大豆
- Planting period for barley: typically April – May.大麦播种期：通常是在4月-5月
- Harvesting period for barley: typically July – August.大麦收获期：通常是7月-8月

NORTH DAKOTA Barley

Seeding Barley 播种大麦

Harvest 收获

Storage 贮藏

Used to store and condition barley用于储存大麦

Can remotely sense moisture and temperature of the grain from phone
可以通过手机远程感应谷物的水分和温度

Can remotely turn aeration fans on and off depending on environmental conditions
可根据环境条件远程开启和关闭通风机

Helps to ensure that product integrity is maintained有助于确保产品完整性

Technology Used 使用的技术

- GPS and Autosteer 全球定位系统和 Autosteer
- No till 未翻耕
- Prescription Fertilizer 配方施肥
- Sectional control for fertilizer and pesticide application分段控制施肥和农药的施用
- Yield mapping 单产图

Prescription Fertilizer配方施肥

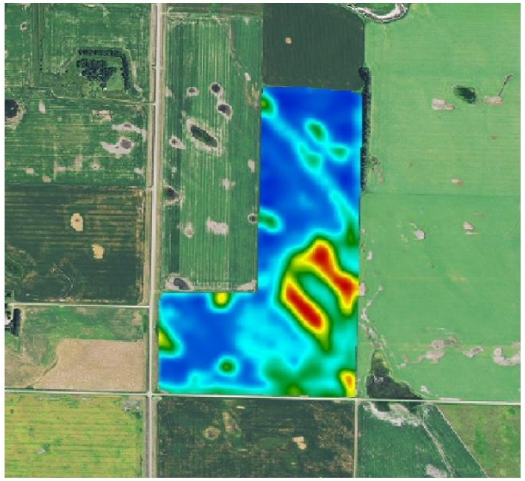
ProfitZ.nutrients

Fertilizer Application Map

Prepared For:	NATHAN BOLL	**Date:**	9/4/2021	**Section:**	23
Common Name:	NAB STON 23 SW			**Quarter:**	SW
County:	Bottineau			**Acres:**	152.2
Township:	STONE CREEK				

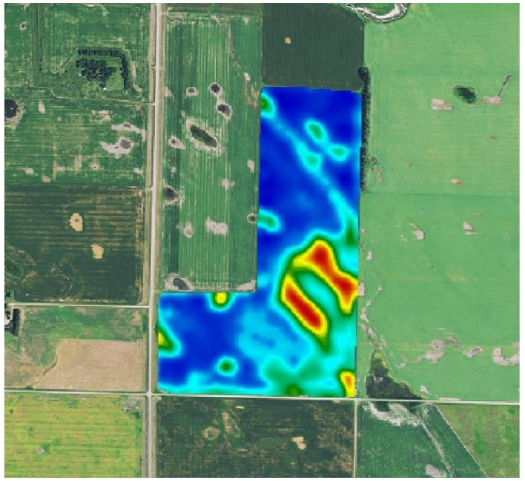
Aerial photography provided by USDA-FSA-APFO

Projected Yield as of 7/25/2019



40.1 70

Variable 46-0-0 Map



145.9 311.8

Current Conditions 当前形势

- 2021 was exceptionally dry 2021年特别干燥
- 2022 has become exceptionally wet 2022 年变得异常潮湿
- Planting has been delayed 3 weeks播种已推迟 3 周
- Hoping for drying weather so planting can begin 希望天气干燥，以便开始播种
- There will areas in North Dakota that will not be able to plant due to excessive moisture北达科他州将有一些地区由于水分过多而无法播种

Overview 概述

- Review market sectors for U. S. barley.回顾美国大麦市场
- Review U. S. barley production trends and factors that impact barley production.回顾美国大麦产量趋势及影响大麦产量的因素
  - Barley area planted and harvested.大麦的收获面积和种植面积
  - Barley production.大麦产量
  - Competing crops.竞争作物
- Review of the shift from trading and purchasing open market barley as a commodity to procuring barley as an ingredient. 回顾大麦作为在公开市场交易和购买的商品到原料的转变。
- Summarize the outlook for U. S. barley production. 总结美国大麦产量前景

NORTH DAKOTA Barley

Market Sectors for U. S. Barley
美国大麦市场

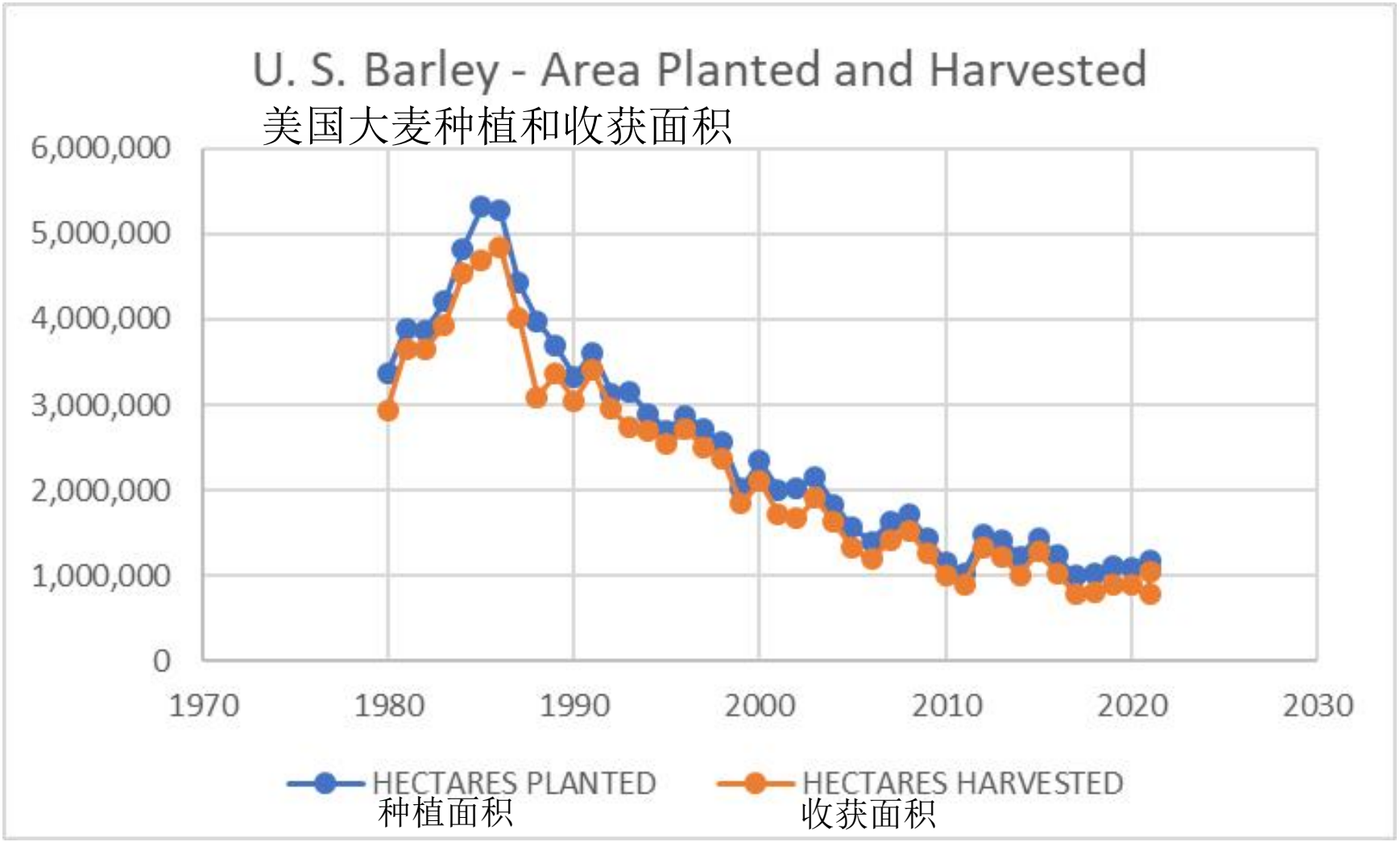
- Malting and Brewing 制麦和酿造
  - Malting barley is a specialty crop that is procured as an ingredient by malting and brewing companies. 啤酒大麦是一种特殊作物，由制麦和酿造公司作为原料采购
    - Buyers contract directly with farmers to buy barley. 买家跟农民直接签订合同购买大麦
- Animal Feed 动物饲料
  - This market sector is largely pet food (cats and dogs).这部分市场主要是宠物食品（猫和狗）
  - Barley for livestock (cattle) is minimal and has largely been displaced by corn. 用于牲畜（牛）的大麦数量很少，大部分被玉米取代。
- Human Food人类食物
  - This is approximately 2% to 3% of U. S. barley production. 这大约占美国大麦产量的 2% - 3%。

NORTH DAKOTA Barley

Barley Planting Trends
大麦种植趋势

- U. S. barley growers have been planting barley at a declining rate since the mid 1980's. 自20世纪 80 年代中期以来，美国大麦种植者的大麦种植一直呈下降趋势
- Area planted and harvested peaked in the mid 1980's at approximately 5.5 million hectares.种植和收获的面积在20世纪80年代中期达到顶峰，约为550万公顷。
- In recent years, area planted trends in the range of 700 thousand to 1.5 million hectares.近年来，种植面积在 70 万至 150 万公顷之间。
- Production area declined at a rate of 121,000 hectares per year from 1988 – 2010. 从1988年到2010 年，生产面积每年减少121,000 公顷。

NORTH DAKOTA Barley



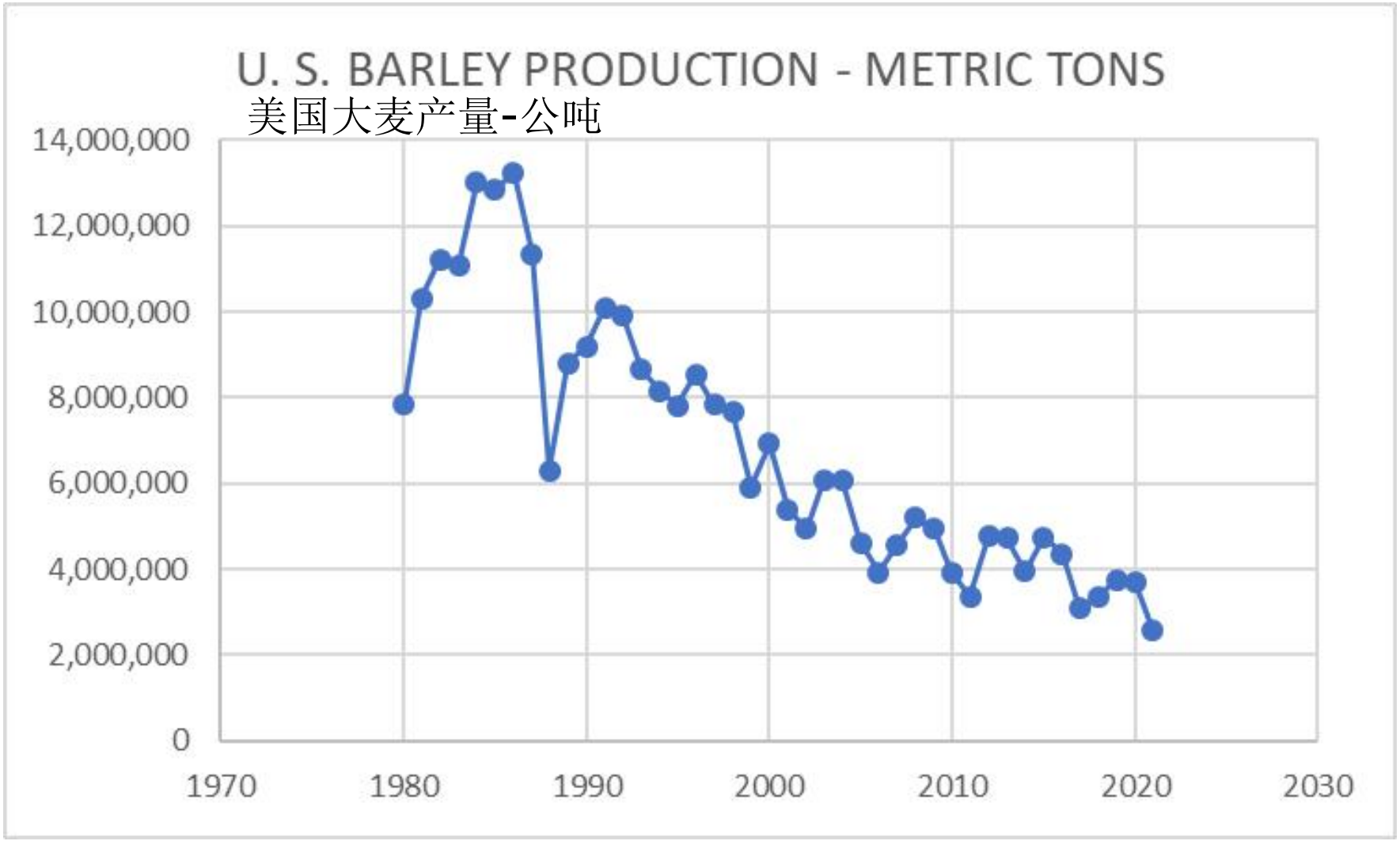
Time period: 1980 – 2022. (Source: USDA-NASS)

时间：1980-2022（来源：美国农业部-国家统计局）

Barley Production Trends
大麦产量趋势

- Likewise, barley production has decreased in the U. S. since the 1980's.同样，美国大麦产量也从20世纪80年代呈下降趋势
- Production peaked at approximately 13 million metric tons in 1986.大麦产量在1986年达到1300万吨的峰值
  - This was due to U. S. farm program that favored barley production.这是由于有利于大麦生产的美国农场项目
- Today, annual production is between 3 and 4 million metric tons.今天，年产量在300-400万吨
- The decrease in 1988 was due to drought
- 1988年的产量下降是由于干旱。

NORTH DAKOTA Barley



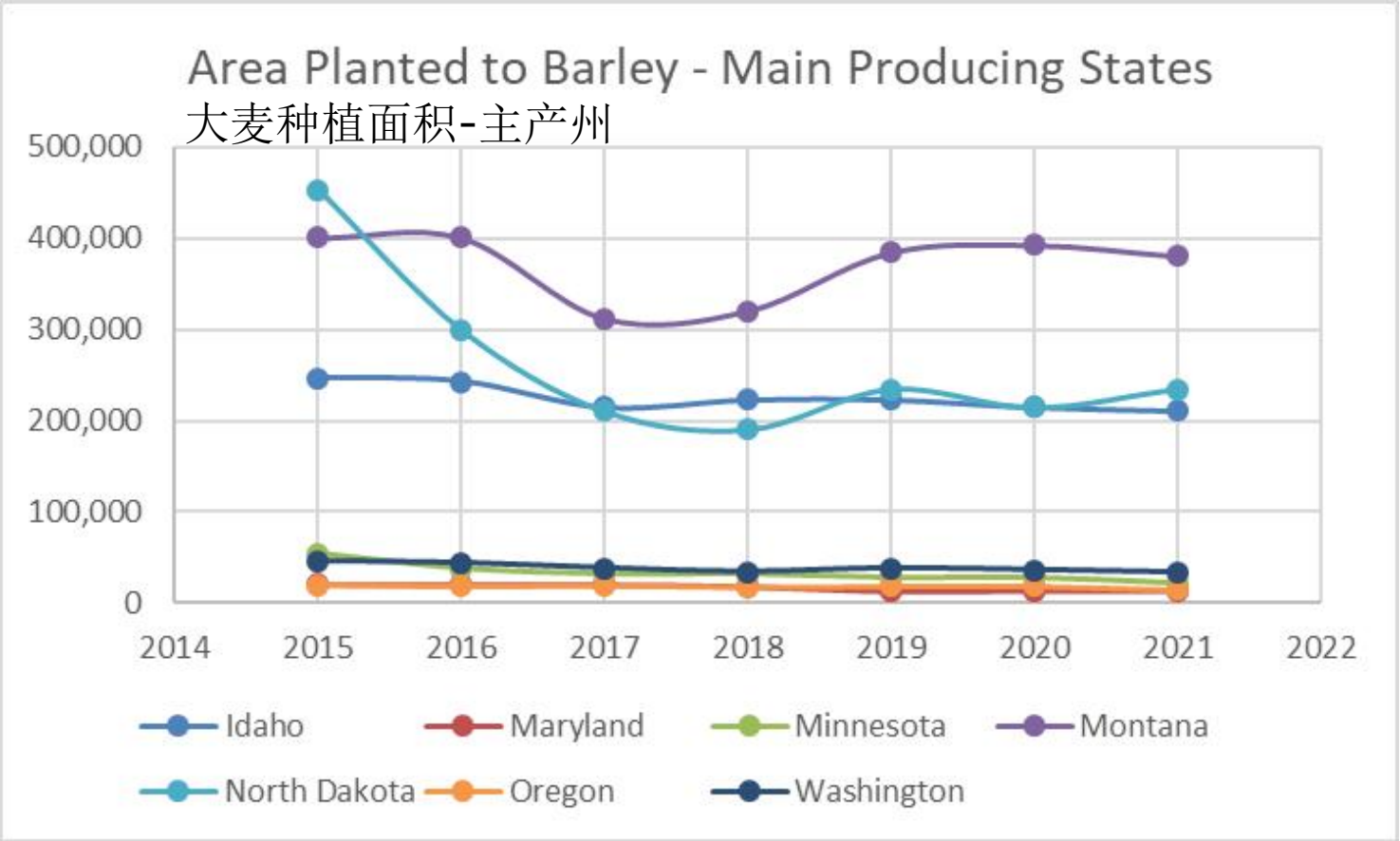
Period: 1980 – 2021. Data Source: USDA-NASS

时间：1980-2021 数据来源：美国农业部-国家农业统计局

Area Planted to Barley (hectares) - NBGA Member States
Source: USDA-NASS
大麦种植面积（公顷）-国家大麦种植者协会成员州
来源：美国农业部-国农农业统计局

Area Planted (Hectares)							Percent Change From
STATE	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2021 to 2022**
Idaho	214,488	222,582	222,582	214,488	210,441	206,394	-2%
Maryland	20,235	18,211	12,950	13,760	13,355	11,331	-15%
Minnesota	32,376	32,376	28,329	28,329	22,258	20,235	-9%
Montana	311,615	319,709	384,460	392,554	380,413	424,929	12%
North Dakota	210,441	190,206	234,723	214,488	234,723	299,474	28%
Oregon	19,021	17,402	18,211	18,211	14,974	14,164	-5%
Washington	38,446	34,399	38,446	36,423	33,590	34,399	2%
	846,621	834,885	939,701	918,252	909,753	1,010,927	
United States:	1,004,047	1,031,161	1,121,813	1,103,197	1,076,487	1,190,206	11%
North Dakota:	20.96%	18.45%	20.92%	19.44%	21.80%	25.16%	
North Dakota % of U. S.:	21%	18%	21%	19%	22%	25%	
NBGA % of U. S. Acres	84%	81%	84%	83%	85%	85%	

NORTH DAKOTA Barley



Approximately 75% of U. S. barley production is concentrated in Idaho, Montana, and North Dakota.
美国约 75% 的大麦产量集中在爱达荷州、蒙大拿州和北达科他州

Units: hectares, 2015 – 2021. Source: USDA-NASS
单位：公顷，2015-2021。来源：美国农业部-国家农业统计局

NORTH DAKOTA Barley

Barley Production Trends for National Barley Growers Association Member States (Data Source: USDA-NASS)

国家大麦种植者协会成员州的大麦产量趋势
（数据来源：美国农业部-国家农业统计局）

Production (Metric Tons)							Percent Change From
STATE	**2017**	**2018**	**2019**	**2020**	**2021**		**2020 to 2021**
Idaho	1,054,885	1,165,490	1,200,109	1,197,496	949,506		-21%
Maryland	44,677	36,578	31,461	33,377	29,393		-12%
Minnesota	112,521	110,866	80,232	51,166	40,715		-20%
Montana	627,379	731,561	976,286	1,083,625	517,101		-52%
North Dakota	541,813	620,303	697,596	630,972	477,474		-24%
Oregon	51,296	30,003	59,439	47,029	13,238		-72%
Washington	98,086	106,490	128,023	139,127	57,915		-58%
Totals:	2,530,658	2,801,292	3,173,147	3,182,792	2,085,342		
United States	3,090,041	3,343,997	3,755,762	3,719,053	2,562,054		-31%
North Dakota	17.53%	18.55%	18.57%	16.97%	18.64%		
Percentage from NBGA	82%	84%	84%	86%	81%		

NORTH DAKOTA Barley

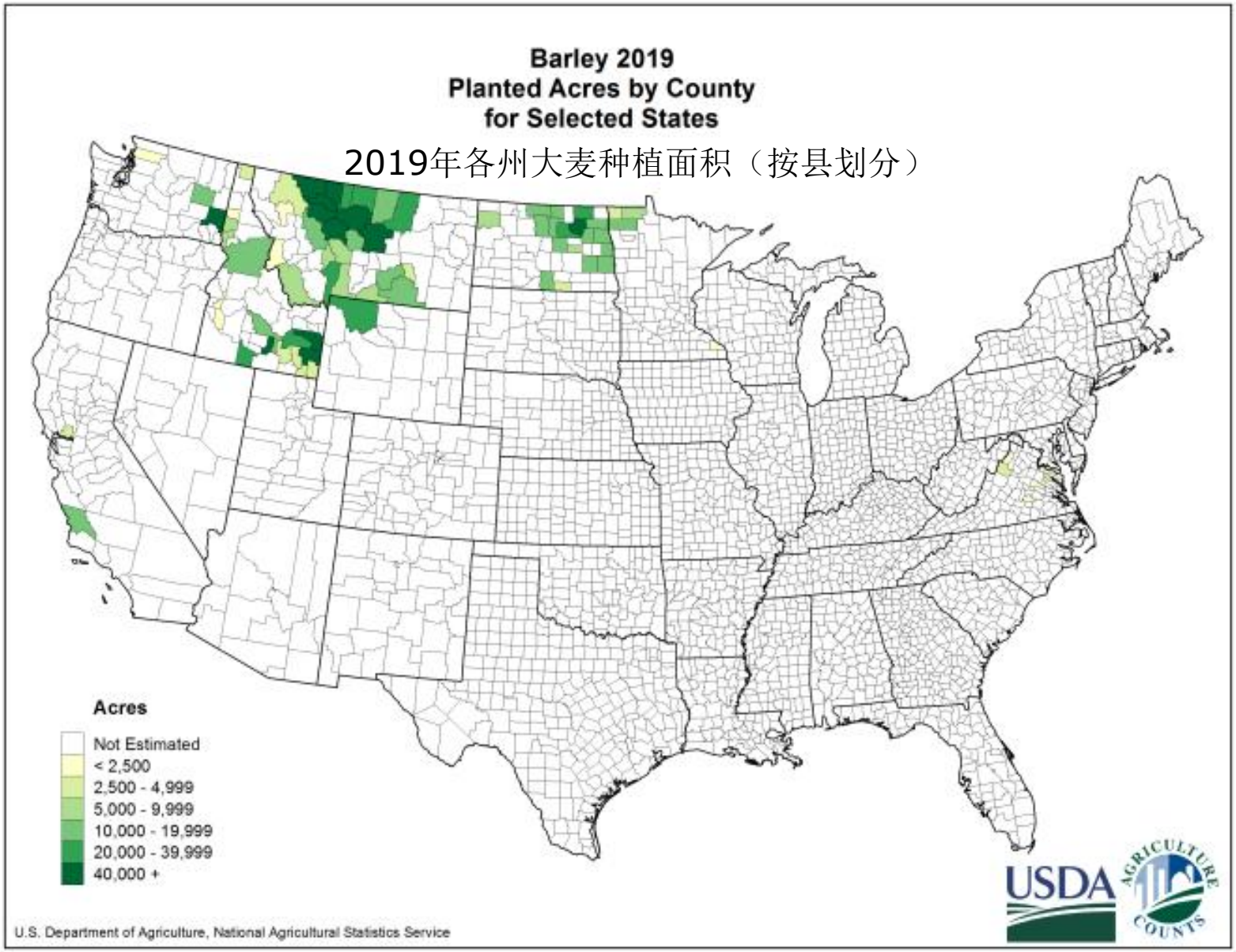
The Shift to Corn and Soybeans
转向玉米和大豆

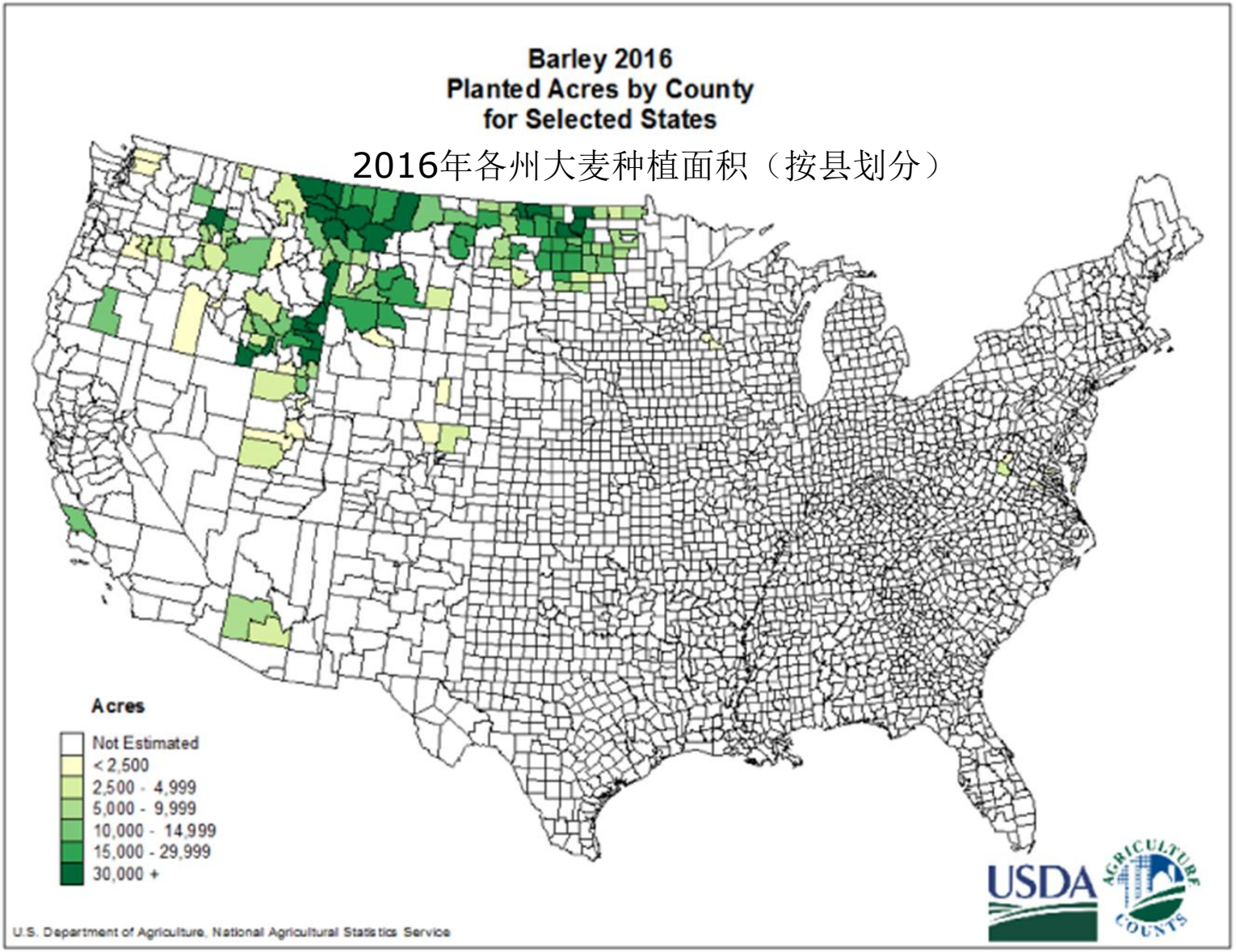
- U. S. farmers shifted their crop production systems from wheat and barley to more corn and soybeans. 美国农民将他们的作物生产系统从小麦和大麦转向种植更多的玉米和大豆。
- New production regions in the northern plains provided farmers with new crop enterprise opportunities in corn and soybeans. 北部平原的新产区为农民提供了玉米和大豆的新作物机会
- Corn and soybeans offer many advantages.玉米和大豆具有许多优势
  - Easy to produce. 易于生产
  - Less storage time (faster inventory turnover). 存储时间减少（更快的库存周转）
  - Prompt payment on delivery (improved cash flow). 货到付款（改善现金流）。
  - Market management tools (futures markets).市场管理工具（期货市场）

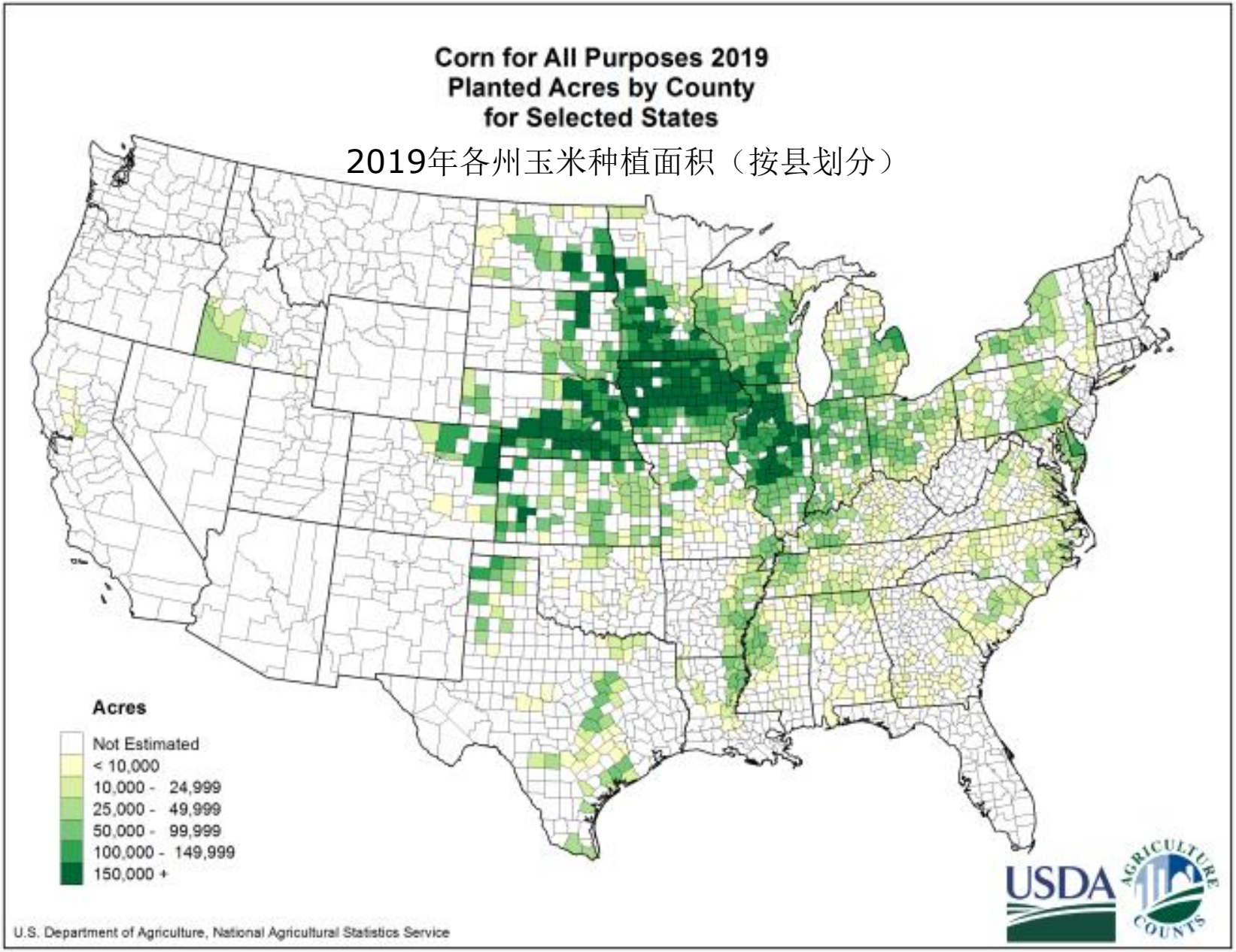
NORTH DAKOTA Barley

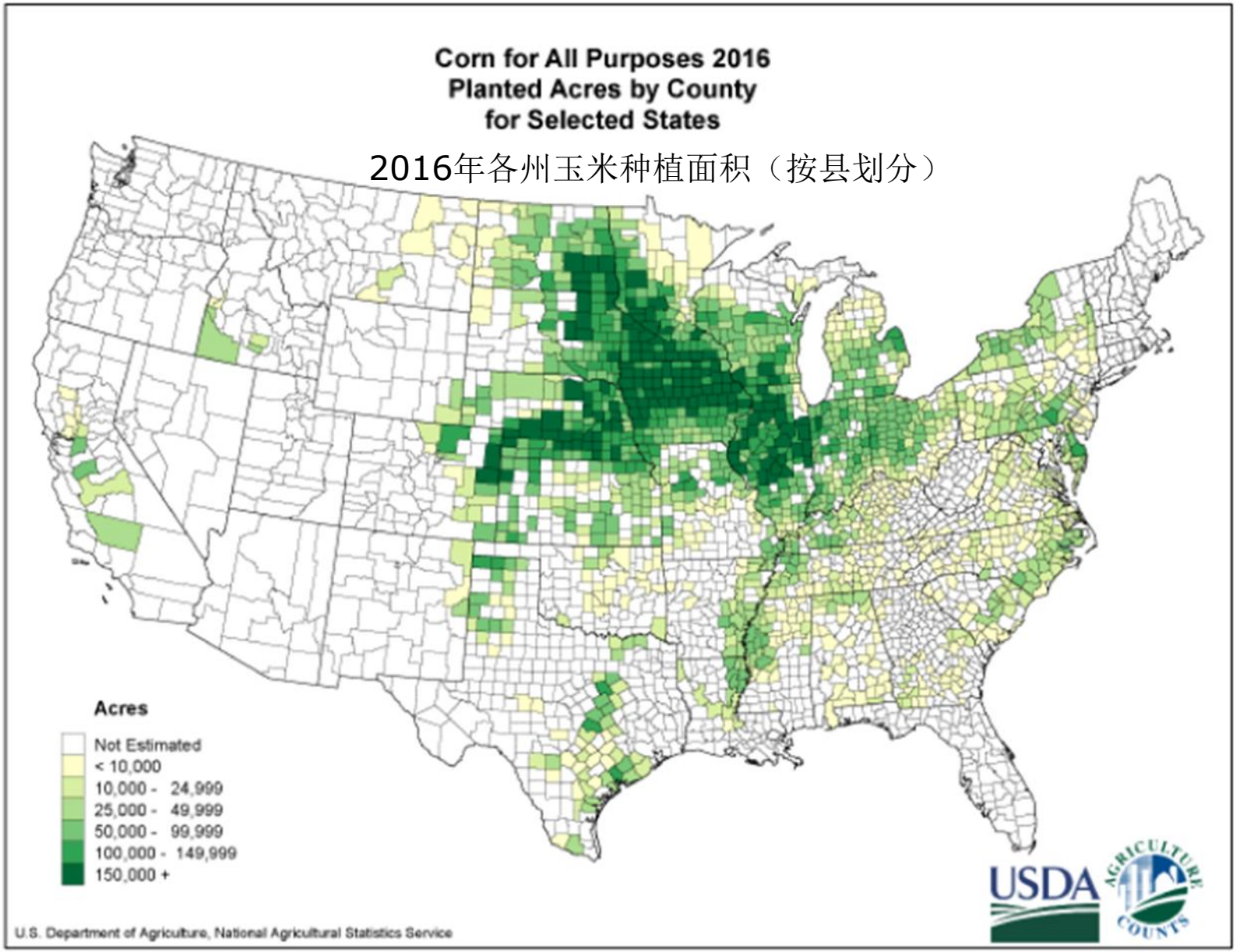
Graphs of Planted Area
种植面积图

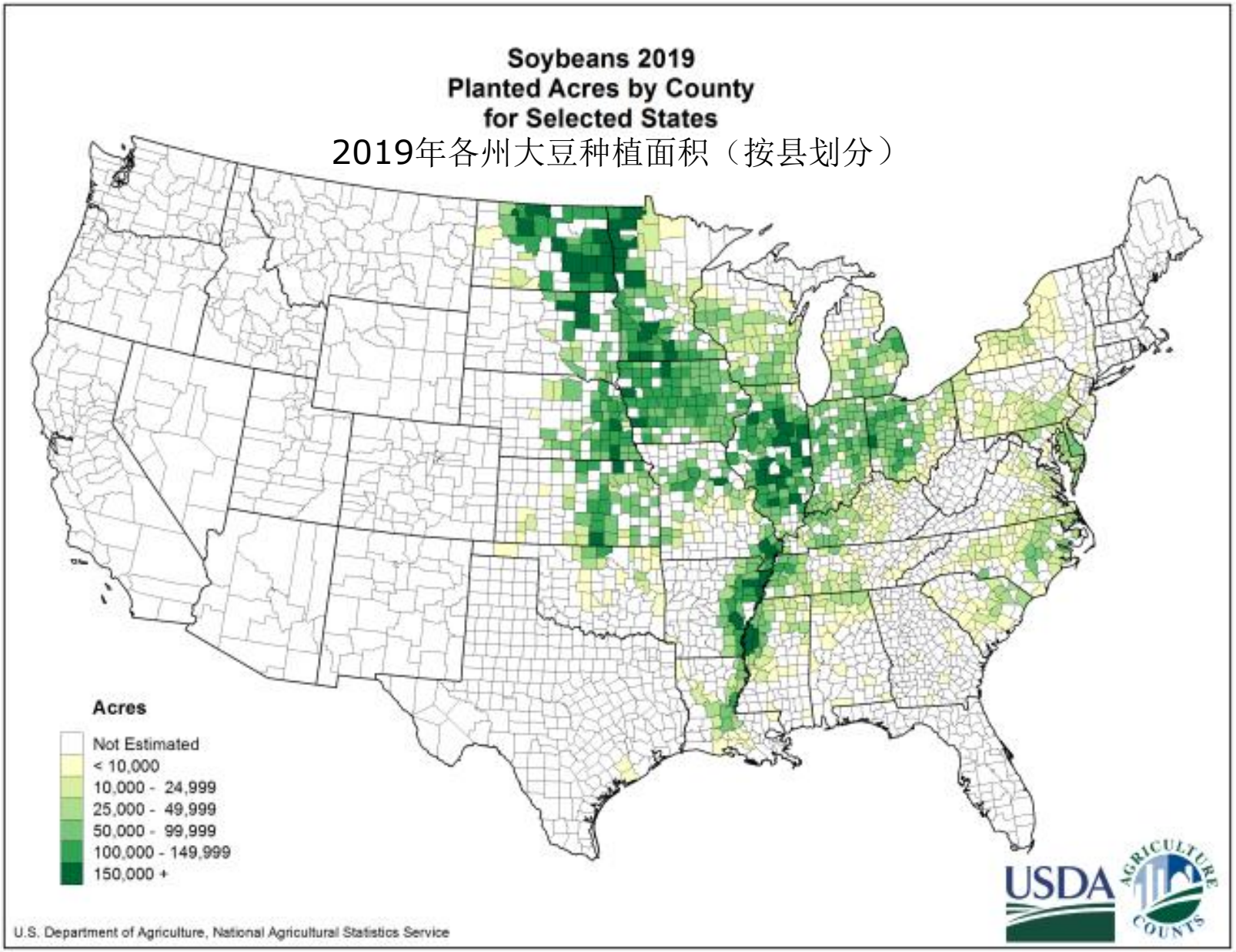
- The following graphs show area planted to barley, corn, soybeans, and spring wheat.接下来的图片显示了大麦、玉米、大豆和春小麦的种植面积。
  - Graphs are from USDA-NASS.图片来自美国农业部-国家农业统计局。
  - There are 2 graphs for each crop to provide a general overview of changes in area planted over time.每种作物都有两张图片，以提供种植面积随着时间变化的总体概览。

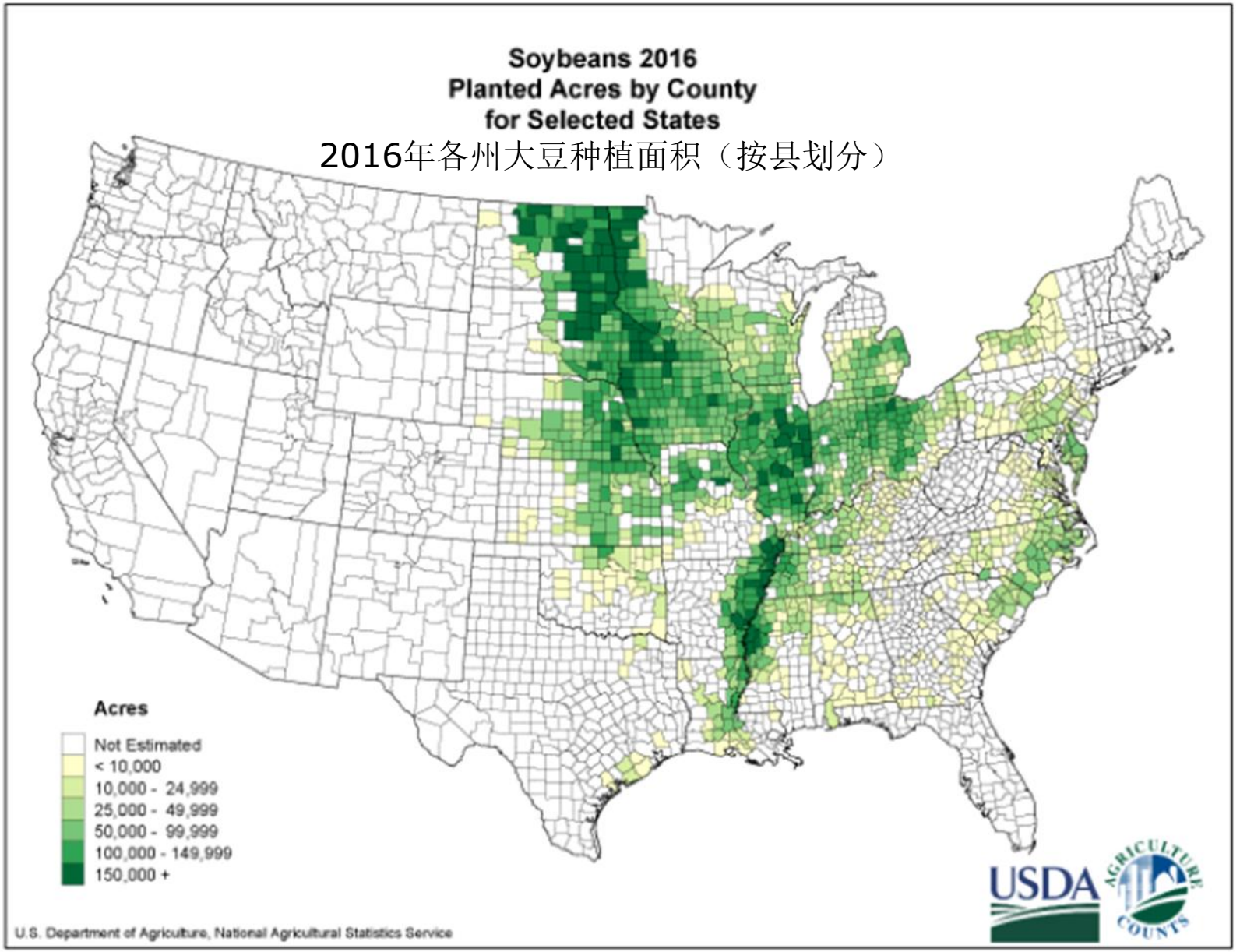

Barley 2019
Planted Acres by County
for Selected States
2019年各州大麦种植面积（按县划分）
Acres
Not Estimated
< 2,500
2,500 - 4,999
5,000 - 9,999
10,000 - 19,999
20,000 - 39,999
40,000 +
U.S. Department of Agriculture, National Agricultural Statistics Service
USDA
AGRICULTURE COUNTS

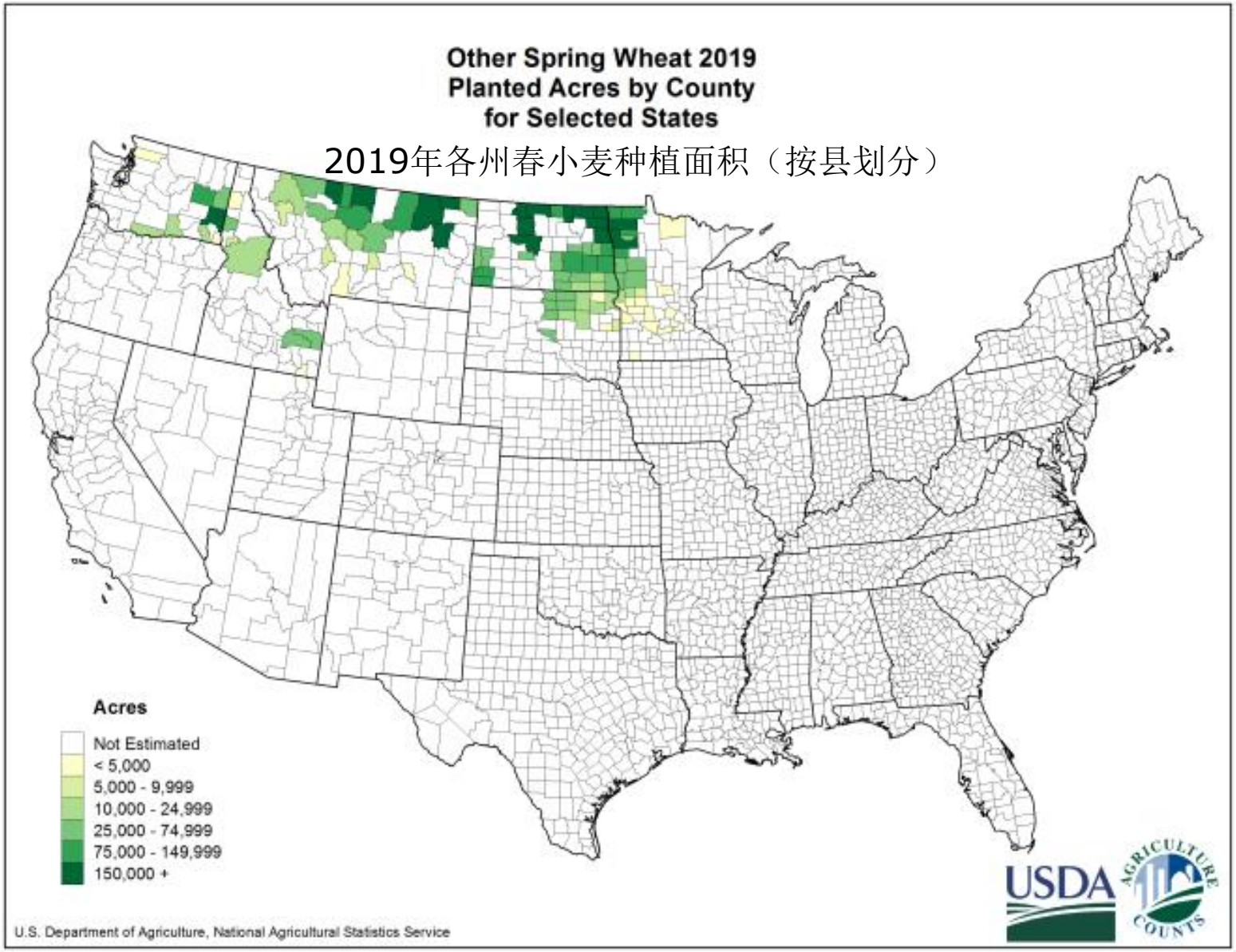

Barley 2016
Planted Acres by County
for Selected States
2016年各州大麦种植面积（按县划分）
Acres
Not Estimated
< 2,500
2,500 - 4,999
5,000 - 9,999
10,000 - 14,999
15,000 - 29,999
30,000 +
USDA
AGRICULTURE COUNTS
U.S. Department of Agriculture, National Agricultural Statistics Service

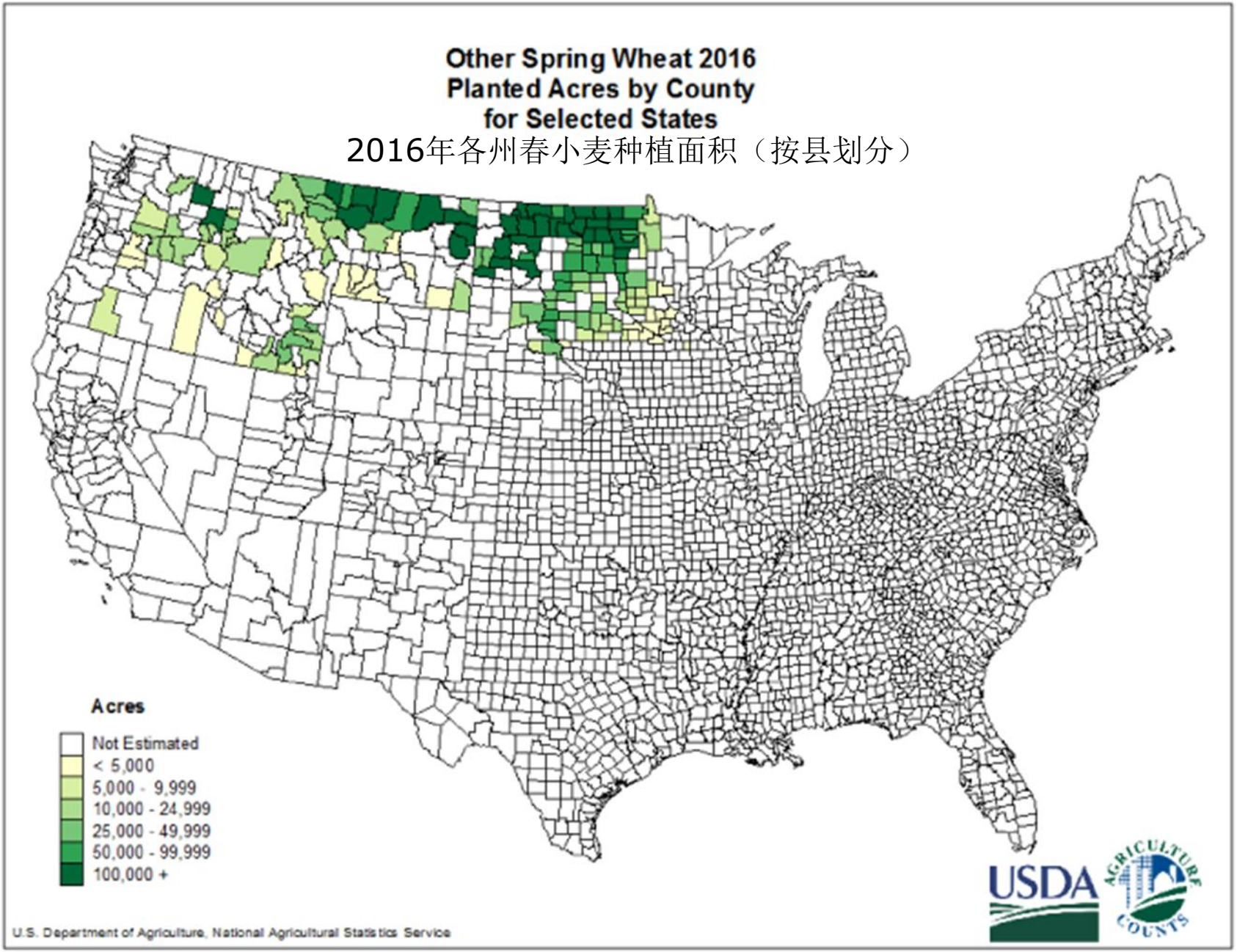

Corn for All Purposes 2019
Planted Acres by County
for Selected States
2019年各州玉米种植面积（按县划分）
Acres
Not Estimated
< 10,000
10,000 - 24,999
25,000 - 49,999
50,000 - 99,999
100,000 - 149,999
150,000 +
U.S. Department of Agriculture, National Agricultural Statistics Service
USDA
AGRICULTURE COUNTS


Corn for All Purposes 2016
Planted Acres by County
for Selected States
2016年各州玉米种植面积（按县划分）
Acres
Not Estimated
< 10,000
10,000 - 24,999
25,000 - 49,999
50,000 - 99,999
100,000 - 149,999
150,000 +
U.S. Department of Agriculture, National Agricultural Statistics Service
USDA
AGRICULTURE COUNTS


Soybeans 2019
Planted Acres by County
for Selected States
2019年各州大豆种植面积（按县划分）
Acres
Not Estimated
< 10,000
10,000 - 24,999
25,000 - 49,999
50,000 - 99,999
100,000 - 149,999
150,000 +
U.S. Department of Agriculture, National Agricultural Statistics Service
USDA
AGRICULTURE
COUNTS

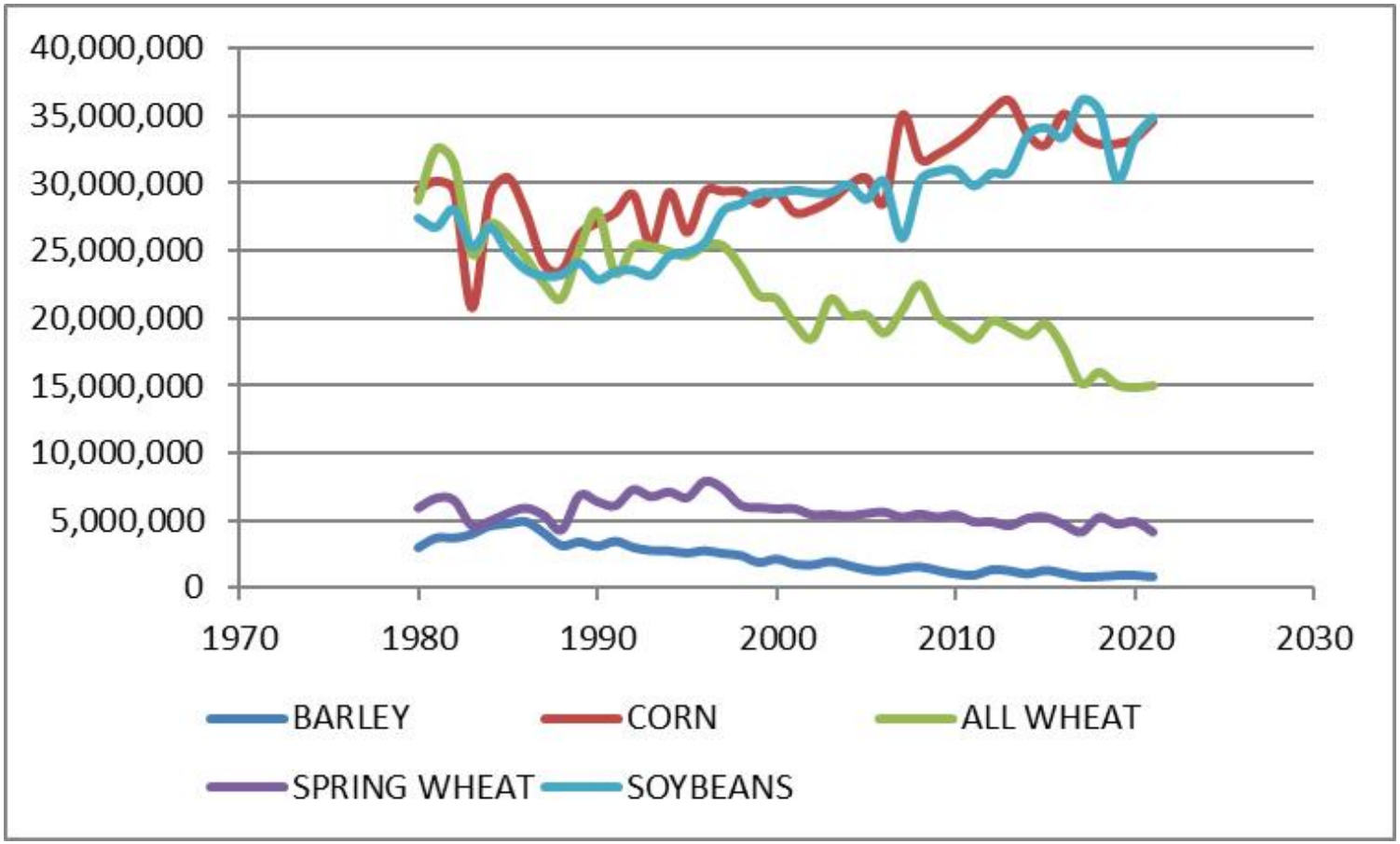

Soybeans 2016
Planted Acres by County
for Selected States
2016年各州大豆种植面积（按县划分）
Acres
Not Estimated
< 10,000
10,000 - 24,999
25,000 - 49,999
50,000 - 99,999
100,000 - 149,999
150,000 +
U.S. Department of Agriculture, National Agricultural Statistics Service
USDA
AGRICULTURE COUNTS


Other Spring Wheat 2019
Planted Acres by County
for Selected States
2019年各州春小麦种植面积（按县划分）
Acres
Not Estimated
< 5,000
5,000 - 9,999
10,000 - 24,999
25,000 - 74,999
75,000 - 149,999
150,000 +
U.S. Department of Agriculture, National Agricultural Statistics Service
USDA
AGRICULTURE COUNTS


Other Spring Wheat 2016
Planted Acres by County
for Selected States
2016年各州春小麦种植面积（按县划分）
Acres
Not Estimated
< 5,000
5,000 - 9,999
10,000 - 24,999
25,000 - 49,999
50,000 - 99,999
100,000 +
U.S. Department of Agriculture, National Agricultural Statistics Service
USDA
AGRICULTURE
COUNTS

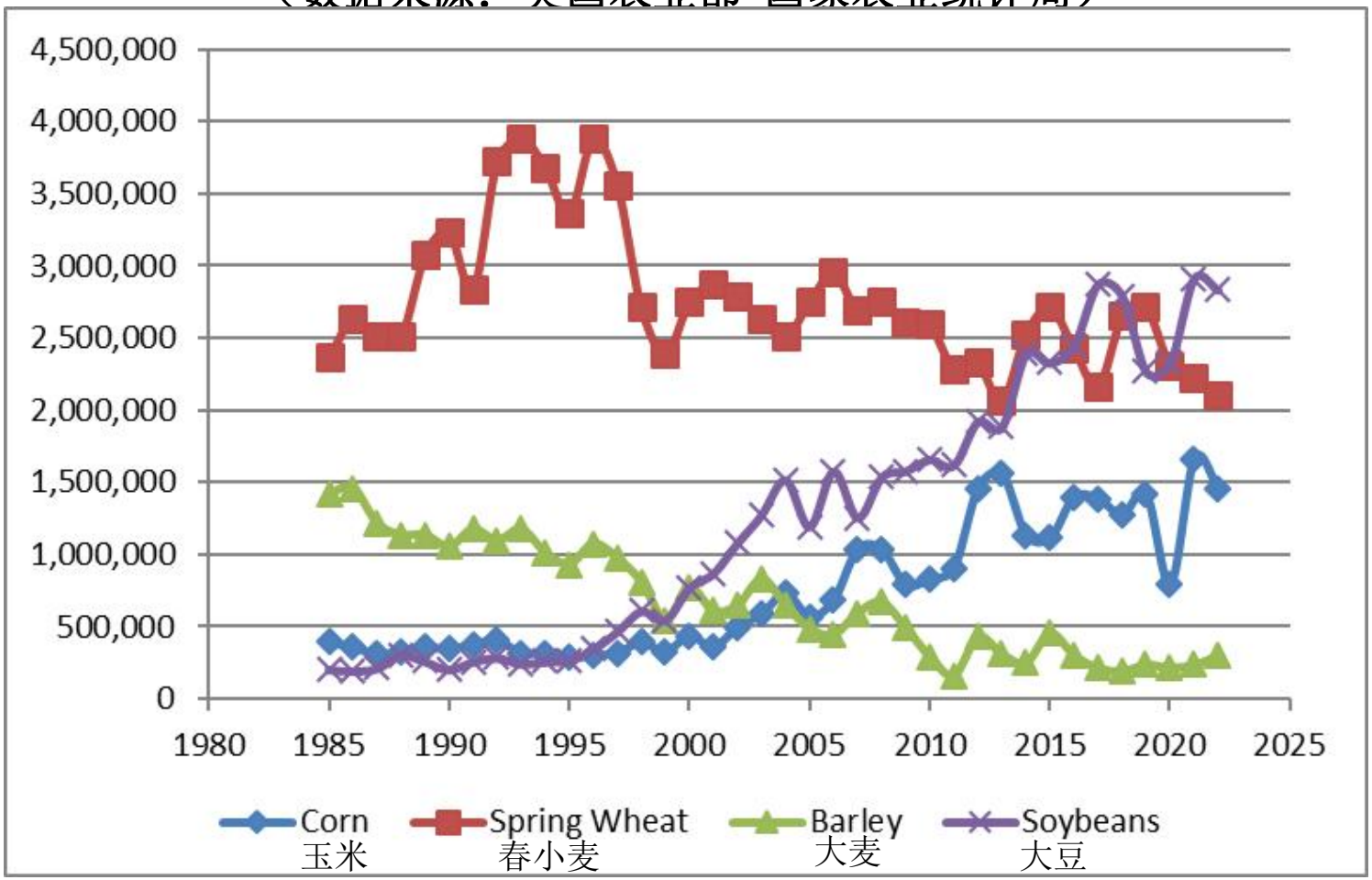
Area Harvested (hectares) for Selected U. S. Crops (Data Source: USDA-NASS) 1980 – 2021

1980-2021年美国主要作物的收获面积（公顷）（数据来源：美国农业部-国家农业统计局）



NORTH DAKOTA Barley

Area Planted (hectares) to Selected Crops in North Dakota
1985 – 2022
Data Source: USDA-NASS
1985-2022年北达科他州主要作物的种植面积（公顷）
（数据来源：美国农业部-国家农业统计局）



NORTH DAKOTA Barley

Barley Utilization and Distribution
大麦的使用和分布

- Historically, the majority of U. S. barley production was utilized in animal feed. 从历史上看，美国大麦主要用于动物饲料。
- As improvements in genetics allowed corn to be produced in new regions, livestock producers shifted from barley to corn as a source of animal feed.随着遗传学的进步，玉米可以在新的地区生产，畜牧生产者从大麦转向玉米作为动物饲料的来源。
- The decline in barley acreage resulted in less production from which malting companies could select barley for malting and brewing purposes.大麦种植面积的减少，导致麦芽公司可选择用于制麦和酿造的大麦产量减少。
- The rapid decline in barley production caused the malting and brewing industry to shift its barley acquisition strategies from open market purchasing to contracting malting barley as a specialty crop ingredient for malting and brewing.大麦产量的迅速下降导致麦芽和酿造行业将其大麦收购策略从公开市场采购转变为订单制，啤麦作为一种特殊作物原料用于制麦和酿造。

NORTH DAKOTA Barley

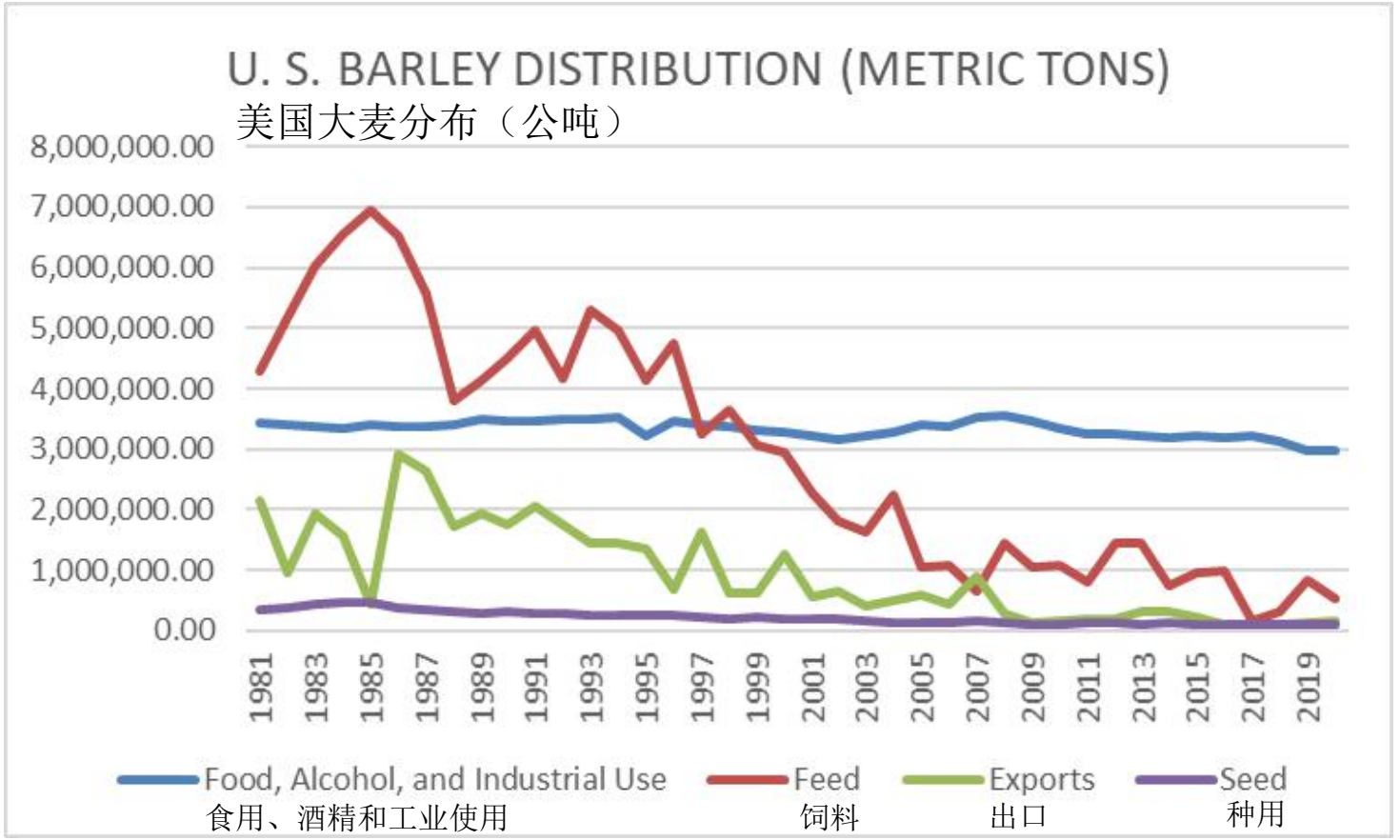
Understanding the Barley Utilization Shift 了解大麦应用的转变

- The following graph assists in understanding the shift in barley utilization and disposition in the United States. 下图有助于理解美国大麦应用的变化 。
- Barley utilization in livestock feed (the red line) declined from a peak of 7 million metric tons in 1985 to approximately 500 thousand metric tons in 2020. 动物饲料中的大麦利用率（红线）从 1985 年的峰值 700 万吨下降到 2020 年的约 50 万吨。
- Barley exports (the green line) were largely for livestock feed. Less barley used in feed in the U. S. translated to less supplies for the export market.大麦出口（绿线）主要用于动物饲料。美国用于饲料的大麦减少，导致出口市场的供应减少。
- The blue line is largely production utilized in malting and brewing. Efficiencies in malting and brewing have assisted in generally consistent barley use of approximately 3.0 million metric tons per year.蓝线主要用于生产麦芽和酿造。 制麦和酿造的效率使大麦的使用量每年约为 300 万吨。
- A brief surge in feed barley exports to Japan in 2007 and 2008 largely forced the malting and brewing industry to develop a new procurement strategy for malting barley. 2007 年和 2008 年，美国对日本的饲料大麦出口量短暂激增，这在很大程度上迫使制麦和酿造行业制定了新的大麦采购战略。

NORTH DAKOTA Barley

Trends in Barley Utilization and Distribution in the U. S. Metric Tons – USDA-ERS Feed Grains Database 1981 – 2020

1981 – 2020年美国大麦使用和分布趋势（公吨）– USDA-ERS 饲料谷物数据库



Barley Utilization Shift
大麦用途的转变

- In the previous graph, prior to the year 2000, there was sufficient supply of barley, and direct contracting with growers was not necessary.
- 在上图中，2000 年以前，大麦供应充足，无需与种植者直接签合同。
  - Malting and brewing companies could select the best 15% to 20% of the crop, and the remainder was sold as animal feed.制麦和酿造公司可以选择最好的 15% 到 20% 的作物，其余的作为动物饲料出售。
- As barley production decreased, buyers had to develop new purchasing strategies for feed and malt.随着大麦产量下降，买家不得不制定新的饲料和麦芽采购策略。

NORTH DAKOTA Barley

PROCUREMENT – CONTRACTING
采购-订单制

- Malting barley is a "specialty crop" produced under contract and sourced as an ingredient. 啤酒大麦是根据合同生产并作为原料采购的"特种作物"。
  - This approach to procurement has caused feed barley buyers to consider direct production contracts with growers to secure a source of supply.
    这种采购方式导致饲料大麦买家考虑与种植者直接签订生产合同，以确保供应来源。
- Buyers have implemented contracting procure barley from growers. Contract components include but are not limited to:买家已执行了从种植者那里采购大麦的合同。 合同组成部分包括但不限于：
  - Area produced (hectares).生产面积（公顷）
  - Quantity produced (metric tons).生产数量（公吨）
  - Price and terms of payment.价格和付款方式
  - Best management practices (planting, fertilizer, etc.).
  - 最好的管理方式（播种和肥料等）
  - Storage and delivery (when and where).储存和交付（何时和何地）
  - Quality specifications (plump, protein, germination).
  - 质量参数（瘪粒度、蛋白和发芽）
  - Act of God (Force Majeure).不可抗力

NORTH DAKOTA Barley

Summary and Outlook
总结和展望

- Farmers will produce barley under the following criteria.
- 农民将按照以下标准生产大麦。
  - It must be profitable in comparison to corn, soybeans, wheat, and other crops.与玉米、大豆、小麦和其他作物相比，它必须是有利润的。
  - It must have crop insurance.它必须有农作物保险
  - It must provide an acceptable risk/reward scenario. 必须提供可接受的风险/回报方案。
- Malt barley is produced under contract with farmers, which requires feed barley buyers to also contract production with farmers. 啤酒大麦是根据与农民的合同生产的，这要求饲料大麦买家也与农民签订生产合同
  - Farmers will produce for the market if the price is profitable. 如果价格有利可图，农民将为市场生产。
- Buyers need to support farmers with stable contract and delivery programs to maintain a consistent supply of barley.
- 买家需要通过稳定的合同和交付计划来支持农民，以保持大麦的稳定供应。

NORTH DAKOTA Barley

Summary and Outlook

- Outlook for U. S. barley for 2022.
- 2022年美国大麦展望
  - Area planted is expected to increase 11% from last year (2021).播种面积预计比去年（2021年）增长11%
    - Approximately 1.2 million hectares.大约1200万公顷
- Western regions (Idaho, Montana, and part of western North Dakota) are currently in a drought situation. 西部地区（爱达荷州、蒙大拿州和北达科他州西部的部分地区）目前处于干旱状态
- Barley markets are strong and competitive with other crops. 大麦市场强劲，与其他作物相比具有竞争力。

NORTH DAKOTA Barley

For Additional Information
其他信息

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THANK YOU 谢谢