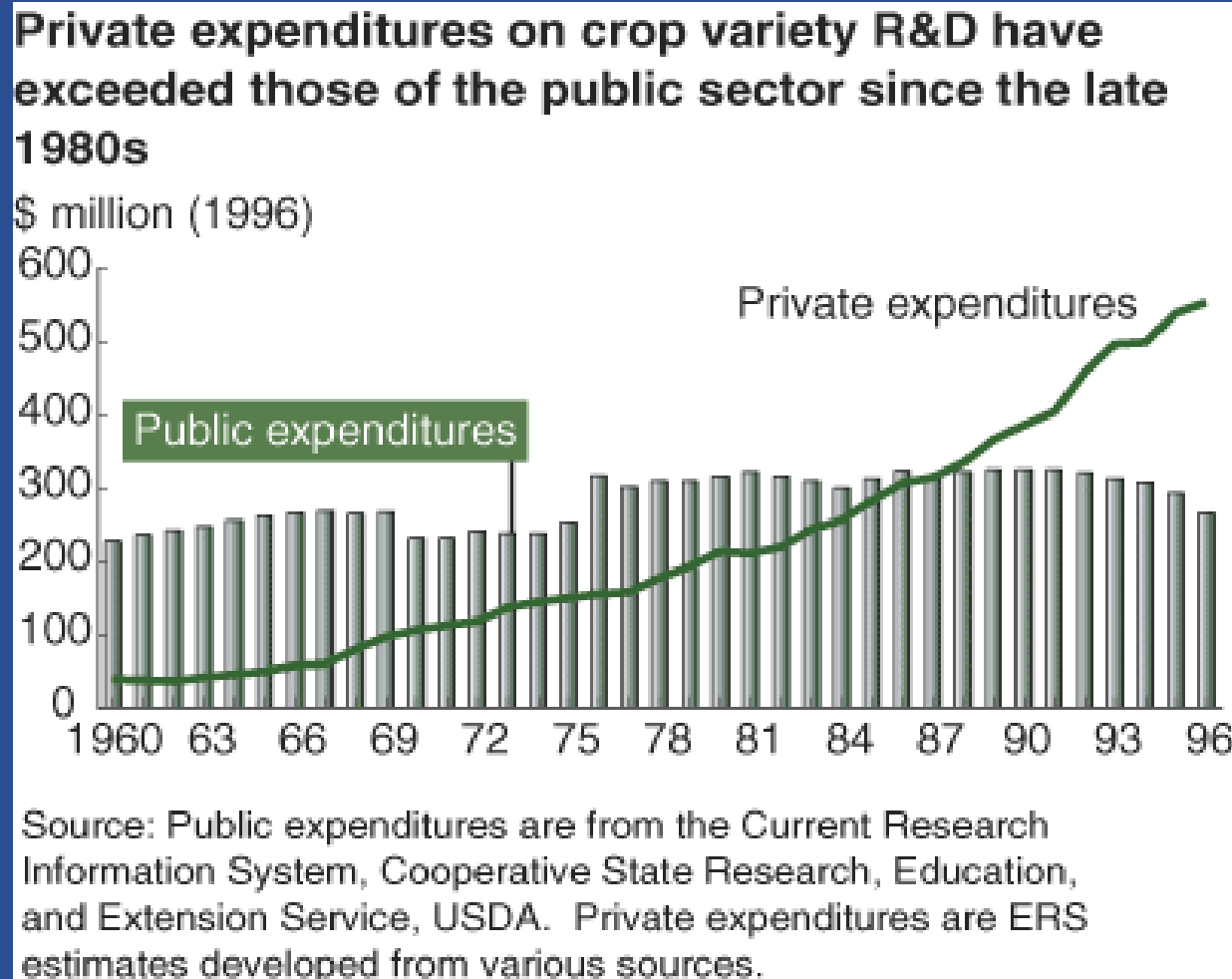


# Seeds and Breeds

# Research and Development



# Iowa State University Organic Ag. Program

- Cultivar evaluations under organic management
  - Field corn
  - Sweet corn
  - Soybeans
  - Oats
  - Alfalfa
  - Red Clover
  - Grapes
  - Flax
  - Bell peppers
  - Medicinal Herbs

# Yield Comparisons Between Organic and Conventional Seed

Year	Crawfordsville Organic Seed Corn Yields	Neely-Kinyon Conventional Seed Corn Yields	Percentage Difference
2000	125.1	141.4	-11.6
2001	119.1	127.9	-6.9
2002	140.6	160.9	-12.6
2003	133.4	111.6	19.5
2004	161.5	180.1	-10.3
Average			-12.2

Year	Crawfordsville Organic Seed Soybean Yields	Crawfordsville Conventional Seed Soybean Yields	Percentage Difference
2000	30.9	28.2	9.3
2003	41.4	30.3	36.5
2004	49.8	45.4*	9.8
Average			18.5

\*2004 conventional soybeans were at the Neely-Kinyon Research Farm in Greenfield

# Organic Cultivar Evaluation

- Organic varieties yielding 10–50% below conventional varieties
- Organic selection in last 6 years
- Yield, pest tolerance and quality data provided to companies

# The American Seed Trade Association

- Founded in 1883
- Consists of 850 company members involved in seed production, distribution, plant breeding, and related industries
- Website: <http://www.amseed.com/>



# American Seed Trade Association



- ASTA's mission is “to be an effective voice of action in all matters concerning the development, marketing and free movement of seed, associated products and services throughout the world.”
- Involved with: Regulatory and legislative matters, new technologies, communication, and education

# Wild Garden Seeds

- Located in Philomath, Oregon
- Receives funding from OFRF for a lettuce variety study
  - Work on re-introducing disease resistance to strains of lettuce and kale
  - <http://www.wildgardenseed.com/>



# Save Our Seed Project

- Founded in fall of 2003
- Managed by the Carolina Farm Stewardship Association
- Works with farmers and extension agents in the southeast U.S. to produce organic and heirloom seed
- Website: [www.savingourseed.org](http://www.savingourseed.org)
  - Working on a database that provides information on all sources of organic seed in the U.S.
  - Contact: Cricket Rakita, Seed Project Coordinator

# The Farmer Cooperative Genome Project (FCGP)

- Coordinator: JJ Haapala, Heron's Nest Farm
- Location: Junction City, Oregon
- Started in 1999 in a collaborative effort to characterize and save seed.
- Encourages development of value-added, farmer owned commodities.
- 2004, awarded grant from the National Research Initiative (NRI) to improve crop genomics for farmers.

# Organic Seed Alliance

- Started in 2000
- Location: Port Townsend, Washington
- Interim President Carl Jones, Lobster Creek Organics
- Organization to connect organic farmers and and plant breeders with education and research programs.
- Supporting on-farm research to improve seed production practices including appropriate technology for seed production, harvest, cleaning and conditioning.



# Horizontal Resistance

- Unlike vertical resistance which is based on a “gene-for gene” model, horizontal resistance is quantitative since traits result from mixtures of multiple gene products.
- Horizontal resistance is more location specific and is selected for over time.
- This type of resistance reduces pesticide dependence.

# Transgressive Segregation

- Transgressive segregation is the segregation of individuals in a cross that shows a more extreme development of a character than either parent gene.
- Horizontal resistance that is needed will be accumulated with transgressive segregation.

# Recurrent Mass Selection

- With recurrent mass selection, enough parents are selected to produce several thousand progeny that are then screened for resistance characteristics through cultivation alone.
- Horizontal resistance is also accumulated with this method since the surviving individuals become the parents of the next generation.

# European Consortium for Organic Plant Breeding (ECO-PB)

- European association that joins the efforts of its members to promote and develop organic plant breeding in organic agriculture.
- Recent projects include Organic Cereal varieties and disease resistant seed treatments for organic grains.



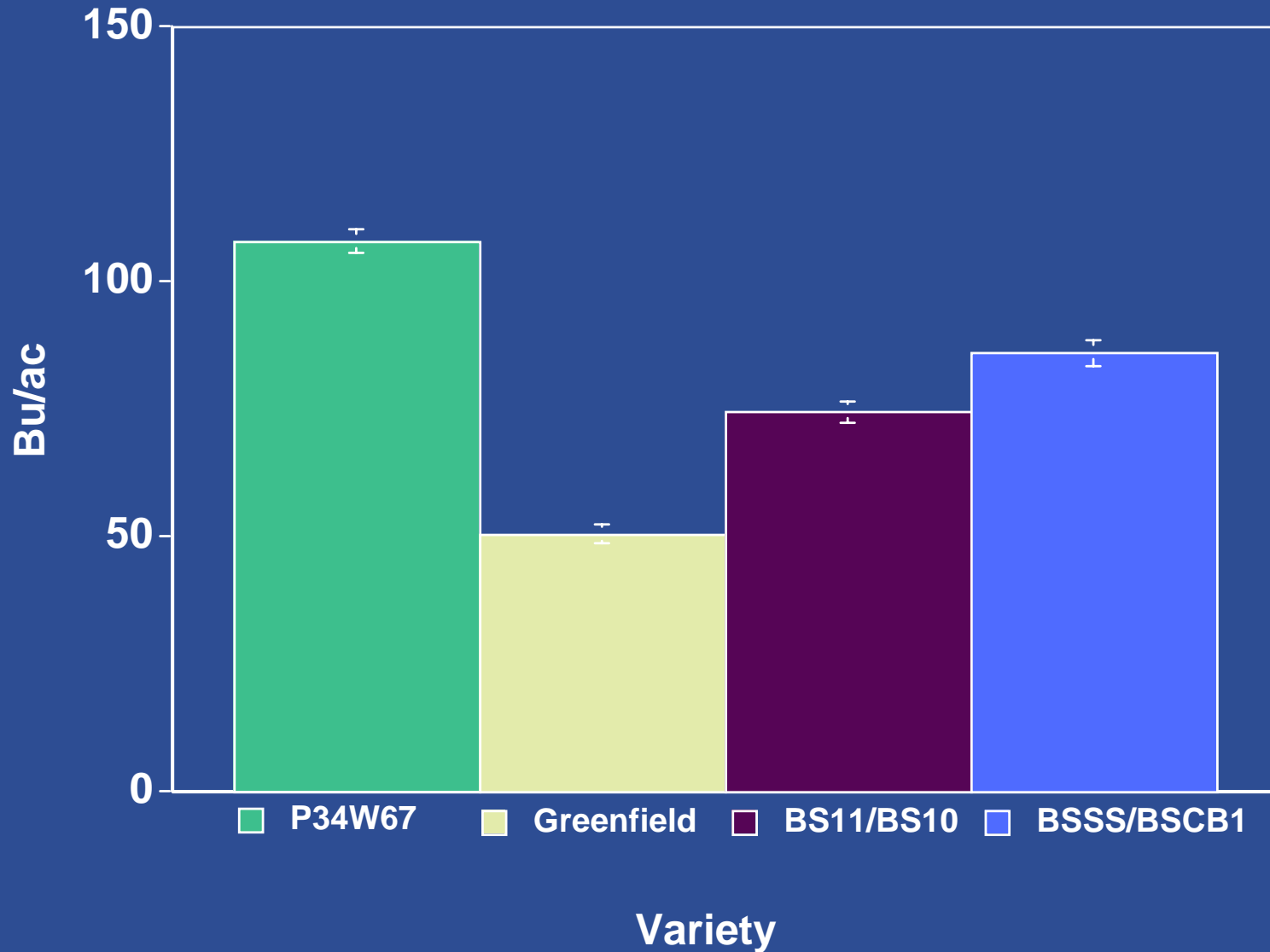
# Public Seed Initiative

- Started in 2000 by Molly Jahn of Cornell University
- Mainly serves the northeast region of the U.S.
- Works to connect growers, researchers, seed companies, and government agencies
- Also provides growers with vegetable seeds adapted to their organic needs.



# Research Projects

# Open-Pollinated Corn Variety Trial - 2001



# Cornell University Plant Breeding

- Directors: Dr. Henry Munger and Molly Jahn, Cornell University
- Muskmelon varieties developed to resist powdery mildew.
- Grown in organic plots, Hannah's Choice and PMR Delicious 51 gave maximum quality and yield.
- Seed is currently available commercially for garden producers.

# Pollen-Tracking

- Computer Based Programs at Iowa State used to determine genetic purity of corn.
- Program uses field design, hybrid information, wind, and local weather conditions to assess contamination from GMO crop.
- Not Available Commercially.

**IOWA STATE  
UNIVERSITY**

# Breeding Projects at Washington State University

- Dr. Stephen Jones: currently working on breeding wheat varieties for organic production
  - Process involves screening over 150 historical wheat varieties
- Dr. Lindsey du Toit: currently working on smut resistance in sweet corn



# Small Grain Cultivar Selection

- Dr. Patrick Carr - NDSU
- Research has been continued by Dr. Hans Kandel and Dr. Paul Porter at the University of Minnesota
- Objective: To identify hard red spring wheat, oat, and barley cultivars that are adapted to the Northern Great Plains regions that are farmed organically.



# Small Grain Cultivar Selection

- Grain yield and quality is improved in organic small grains with modern rather than old commercial cultivars.
- Differences in grain yield were not recognized between organic and conventional seed lots.

QuickTime™ and a  
TIFF (Uncompressed) decompressor  
are needed to see this picture.