Innovative Approaches in Agriculture at CSU
Agriculture requires innovative approaches

- Humanity’s single biggest industry (Ehrlich and Ehrlich, 2013)
  - ensure global food security

- Technology-dependent global food system

- What’s needed:
  - close the yield gap
  - ensure economic viability
  - preserve natural resources

- Requires innovation in Ag research and education to ensure global food security through sustained food production
Research Centers
CSU Agricultural Experiment Station
Multiple environments: multiple facilities

Arkansas River Valley

San Luis Valley

Laboratories

Natural environments

On farm sites

Plainsman
Western Colorado
Yellow Jacket
ARDEC
ARVRC
SLVRC
BIC
Akron
Maxwell Ranch
Multiple scales: multiple audiences

Organism

Field

Watershed

Agriculture

Homeowners

Communities
Colorado State University Agriculture and Outreach
Innovative Approaches at CSU: Education

• Agribusiness Management degree on-line completion

• Establishing a program in Ag Literacy

• Developing joint programs with community colleges

• New curricula to attract non-traditional students: eg. Biomedical Ag, Food Systems
Gary and Kay Smith Global Food Innovation Center
Innovation in Breeding

Ultragrain®High Performance
The next generation of whole wheat flour

- Halt 1995
- Yumar 1997
- Prowers 1997
- Prowers 99 1999
- Prairie Red 1998
- Avalanche 2001
- Above 2001
- Ankor 2002
- Hatcher 2004
- Bond CL 2004
- Ripper 2006
- Bill Brown 2007
- Thunder CL 2008
- Snowmass 2009
- Byrd 2011
- Brawl CL Plus 2011
- Denali 2011
Return on Investment: Wheat

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<th>Cost</th>
<th>Benefit/Cost</th>
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December 2012
EDR 12-03

Economic Development Report

Department of Agricultural and Resource Economics, Fort Collins, CO 80523-1172
http://dare.colostate.edu/pubs

AN EVALUATION OF COLORADO STATE UNIVERSITY’S WHEAT BREEDING PROGRAM: ECONOMIC IMPACTS ON WHEAT YIELDS

Ryan Mortenson, Dustin L. Pendell, Jay Parsons, and Scott D. Haley
Innovation in irrigation Optimization

(Sustainable cropping systems that reduce consumptive water use - Hansen et al)

Techniques and Technologies to verify water use and water savings

Irrigation Scheduling mobile app (Allan Andales)
Innovation in Food Safety

Multiple Hurdle Technology in Food Safety
Governors Blueprint for Agriculture/Value Chain Analysis

• Cultivate Innovation and Technology
  – Identify the multitude of food and Ag businesses, entrepreneurs, and innovators
  – Establish CO as a hub of innovation

• Value Chain Analysis
  – VC traces the CO agricultural production network, from raw materials and inputs through final ag products
The value chain of agriculture

- Crop production
- Livestock production
- Bioenergy feedstock
- Food crop harvests
- Crop processing (sorting, milling, pressing)
- Pest control
- Fertilizer
- Equipment
- Energy
- Water resources
- Land resources
- Livestock genetics
- Crop genetics
- Animal health & vet care
- Other animal products
- Meat production
- Dairy production
- Processing, packing, bottling
- Intermediate ingredients
- Fresh market
- Food & beverage manufacturing
- Fuels blending
- Food & beverage retail stores
- Food & beverage service
- Other retail
- Open spaces, ecosystem services, wildlife habitat, etc.

Companies:
- DuPont
- Pioneer
- JBS
- Front Range Energy
- Ardent Mills
- New Belgium
- Consumers
Location of authors on scientific publications in agriculture and food

Location of inventors on U.S. patents in agriculture and food
The Emergence of an Innovation Cluster in the Agricultural Value Chain along Colorado’s Front Range (Oct 2014)

- Recognizes the emergence of an innovation cluster.
- Explores the economic fundamentals driving its growth.
- Identifies the main technology categories and interrelationships among them.
- Takes an inventory of companies and organizations.
- Recommends next steps.
Innovators are creating technologies in Colorado that redefine how we produce, process, distribute, and consume food.
Colorado’s innovators concentrate in a dozen interrelated technology categories

Advances in one area creates new opportunities in others.
“Advancing the Agriculture Economy through Innovation” Summit

• Lory Student Center, March 18-20, 2015

• Bringing together agricultural innovators and innovators who may not recognize their connection to agriculture

• Outgrowth of the study led by Greg Graff
  – “The Emergence of an Innovation Cluster in the Agricultural Value Chain along Colorado’s Front Range”

• For more information and to register:
  – csuaginnovationsummit.com