



# Preparing a Globally Competitive Talent Pipeline in 21<sup>st</sup> Century AGRICULTURE

**New England Workforce Network**

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# How are you building your talent pipeline?

- ▶ Is your Workforce Board prioritizing Ag Science & Food Processing Sectors?
- ▶ Do Workforce Development Staff know how to provide career pathway entry points for Agriculture, Food and Natural Resource Industries?

# What is 21<sup>st</sup> Century Agriculture?

- ▶ Tradition meets Technology
- ▶ Problem solver now Innovator/Entrepreneur
- ▶ “Farm kid” now ideal employee
- ▶ Occupational life style relies more on automation

# DEVELOPING PLATFORMS FOR SUCCESS

To remain competitive Rural economies will depend on

- *the broadening scope of 21st Century Agriculture - where tradition meets technology*
- *innovation, technology and production are driving the research frontier on*
- *food, water and clean energy*



# NORTHEAST



# ECONOMIC ENGINE

Agriculture, Forest Products and Commercial Fishing



Agriculture - Production & Processing

Forestry - Logging and Processing

Commercial Fishing - Aquaculture & Processing

Data from 2012  
IMPLAN MODELING  
UConn RESEARCHERS

# Why prioritize Ag Sector for employment and training in your state?

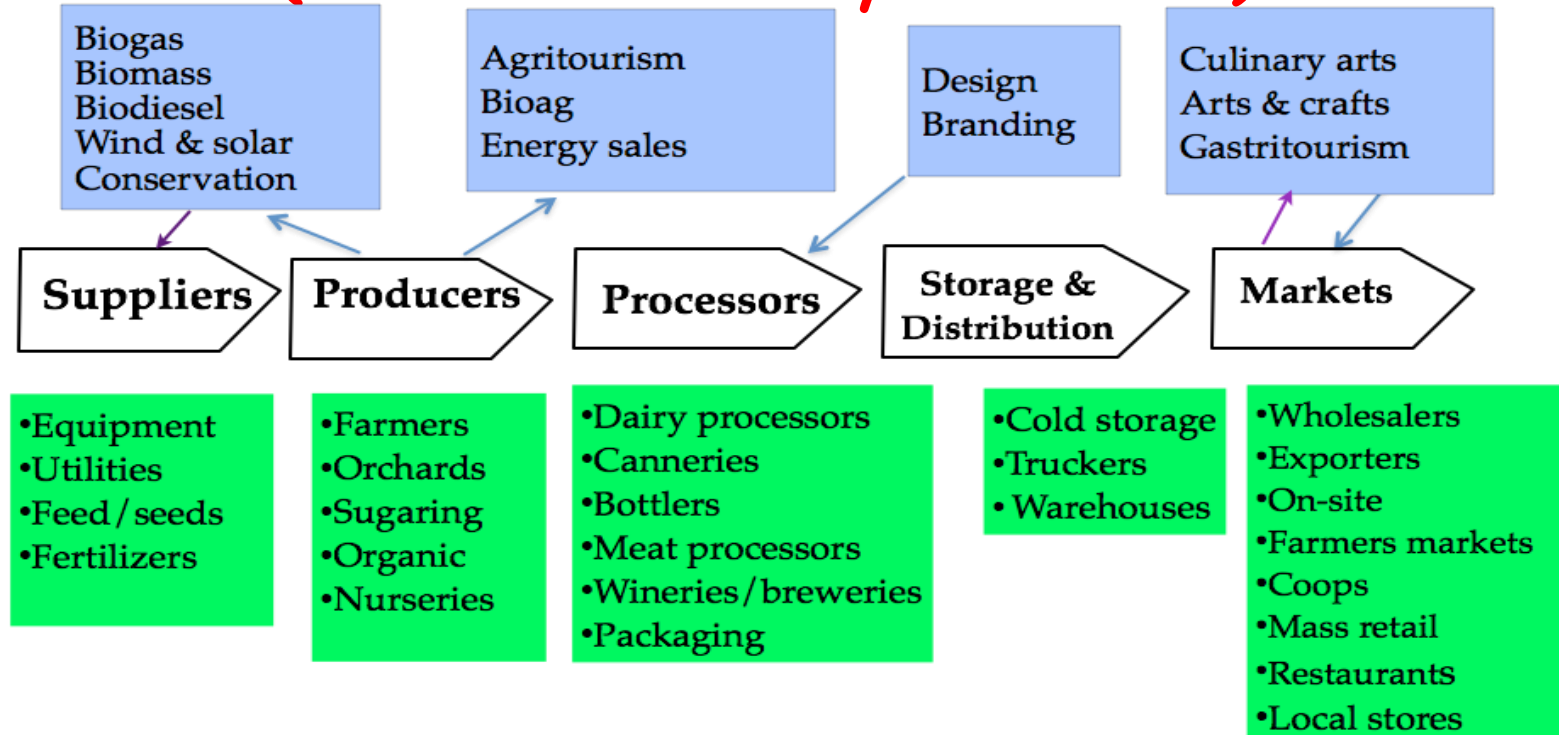
- ▶ Connecticut
  - ▶ 25,500 JOBS
  - ▶ \$4.8 BILLION
- ▶ Maine
  - ▶ 79,000 JOBS
  - ▶ \$13.9 BILLION
- ▶ Massachusetts
  - ▶ 60,760 JOBS
  - ▶ \$12.750 BILLION
- ▶ New Hampshire
  - ▶ 18,773 JOBS
  - ▶ \$3.1 BILLION
- ▶ Rhode Island
  - ▶ 6,591 JOBS
  - ▶ \$1.05 BILLION
- ▶ Vermont
  - ▶ 37,000 JOBS
  - ▶ \$6.6. BILLION

**\$42 BILLION ECONOMIC IMPACT / @ 230,000 jobs**

# PRIORITIZE AGRICULTURE and CREATE A NEW PORTRAIT of 21<sup>ST</sup> CENTURY AG

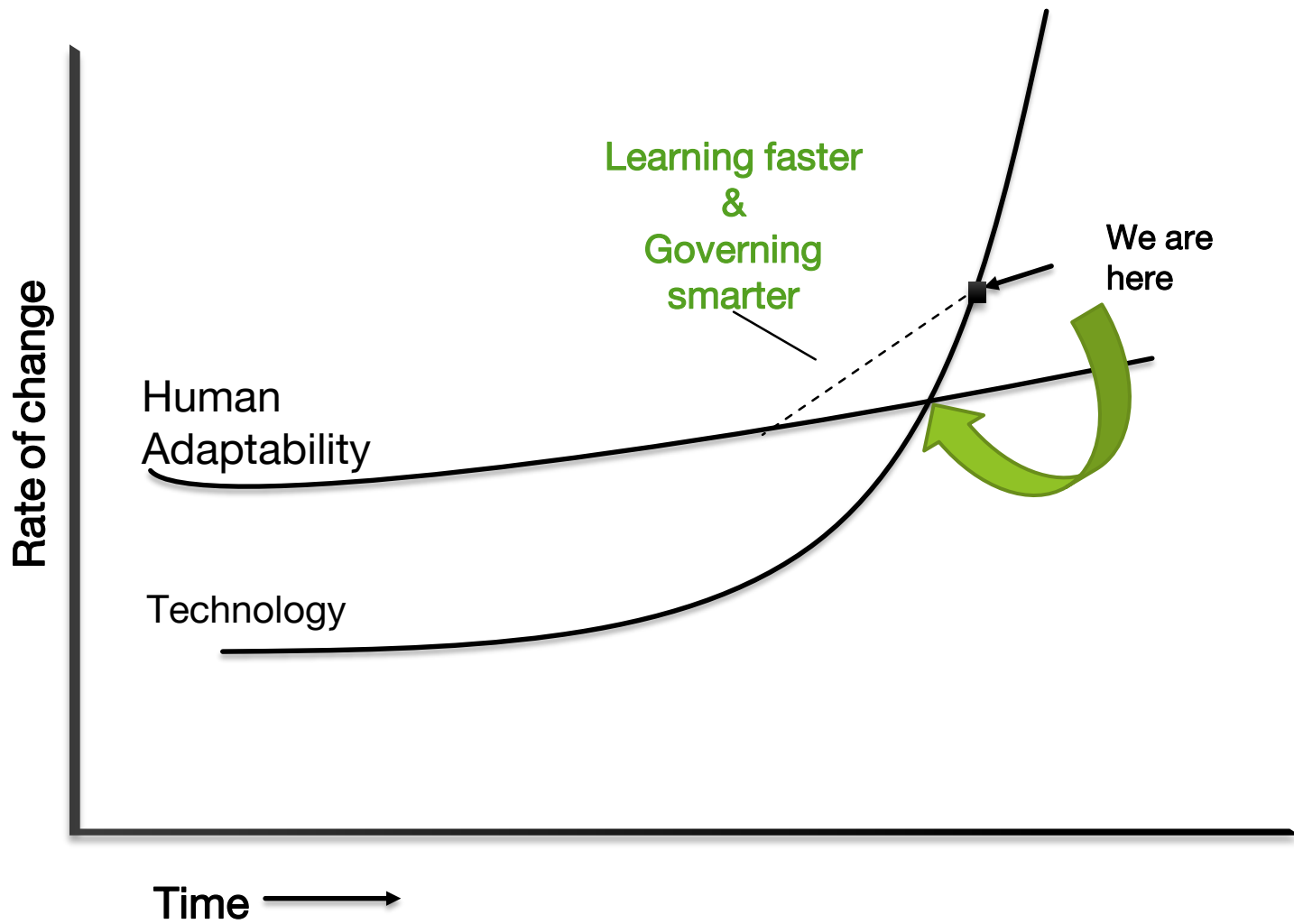
- *Utilizing a CLUSTER APPROACH*
- *BUILD NEW LEARNING ENVIRONMENTS & NEW NETWORKS*
- *PARTNER WITH FARMERS - CREATE INTERNSHIPS & APPRENTICESHIPS*
- *MEET THE NEEDS OF FARMERS IN AG PRODUCTION, FOOD PROCESSING*

# VT's Sustainable Food System Cluster (slide courtesy of RTS)



*Support infrastructure*  
Associations, services, research, educational institutions, banks





Source: Thomas Friedman, *Thanks for Being Late*, 2016 Graph tracking velocity of change since 2007

# What models will support faster learning?

- ▶ Pre-Apprenticeships for High Schoolers
- ▶ Workbased learning environments -
  - ▶ Articulation agreements with Community College programs
  - ▶ Connect WIOA certification & funded training w career pathway
  - ▶ Maker spaces & Incubator/Accelerator spaces
- ▶ Student Cohorts - build student networks by bringing small teams together who participate in career exploration by sector
  - ▶ The experience of real time work environments becomes platform to build in soft skills and peer group discussion about related career pathways, pitfalls and opportunities

# Vermont's Addison County Food Commons

- Cooperative working space for entrepreneurs
- An active learning environment for users
- Work based Learning and Mentorship
- Creating an environment of social responsibility
- Creative Inspiration for this model came ... DaVinci College, Sustainability Factory Model, Dordrecht, Netherlands

<http://www.mecanoo.nl/Projects/project/41/Da-Vinci-College-Regional-Education-Centre?c=0>

# ACORN'S 2018 WINTER FARMER TO FARMER SERIES

- PLANNING AHEAD BY LOOKING BACK
- FARM TO FARMSTAND RETAILING FOR FARMERS
- GROWING YOUR FOOD BUSINESS
- CREATING A NIMBLE BRAND
- WORKING WITH DISTRIBUTORS
- MEETING NEW DEMAND FOR HEMP AND HEMP PRODUCTS
- AGRI TOURISM

# New Ways of Earning Require New Ways of Learning

- ▶ **Red Wing Ignite** - Accelerator with entrepreneurial support to develop Next Generation Ag Technology
- ▶ **Providing Platforms for Success** -
  - ▶ MN Legislature funded career exploration program for 16-17 year olds
  - ▶ Formed Goodhue County Collaborative - Youth Skills Training Program 2018
- ▶ **Makerspaces** - Coderdojos, Hackathons
- ▶ **Student cohorts** - building student network and soft skill development
- ▶ **Peer to Peer Mentorship**
- ▶ **Reverse Elevator Pitch event**
- ▶ **MN Ignite CUP**

# Why and what's required for governing smarter?

- Community and Technical Colleges on the front lines of this change: System agility and adaptations in support of new reality
- Address crisis in worker shortage by utilizing adaptations referenced
- Due to on the velocity of change and slow pace of human adaptability
  - SYSTEMS of education and workforce development joint focus on closing the gap in that triangle
- Utilize WIOA proactively with Minority population outreach
- Build scaffolds of certifications connected to college credit
- Focus delivery model to match Millennial learning style
  - ▶ short courses - hybrids - online & facetime

# THIS IS NOT YOUR GRANDFATHER'S AG SHOP

## ROBOTICS

### Robotic Milkers replacing human milkers

- ▶ The intersection of nutrition, animal welfare, and machine

### Robotic carcass breakdown

- ▶ Revolutionizing poultry and red meat processing

### GPS driven tractors

- ▶ Once a fancy trick, now the norm

### Drones

- ▶ Implemented in every facet of Ag production today

# MORE COOL STUFF

## STEM to STEMA

**Feeding 9 billion without destroying the planet- Now there is an Inquiry Based Education challenge!**

- Anaerobic Digesters - Creating renewable energy from waste
- Clean water through Reverse Osmosis
- Holistic Orchard - Working with nature not against
- Bio Fuel Technology



# Worker Shortage - CONVERGENCE OF MANY FACTORS

1. DISCONNECT ACROSS STATE AGENCIES IN DATA COLLECTION AND ANALYSIS of AFNR EMPLOYMENT
2. LACK OF CURRENT AND PROJECTED EMPLOYMENT NEEDS SPECIFIC TO AGRICULTURE AND FOOD PRODUCTION
3. LACK OF UNDERSTANDING ABOUT HOW TO SERVE AG AND ITS MANY SUBSECTORS IN WORKFORCE DEVELOPMENT
4. LACK OF RECOGNITION AND SUPPORTS FOR THE EMERGING NEXT GENERATION OF FARMERS
5. IMPACT OF ANTI-IMMIGRANT POLICY
6. NEED TO EDUCATE TEACHERS, STUDENTS, PARENTS WITH A FRESH PORTRAIT OF 21<sup>ST</sup> CENTURY AG

Here's a quick overview of what's happening in these 4 states?

- ▶ Pennsylvania
- ▶ Illinois
- ▶ Washington
- ▶ Minnesota

# Pennsylvania Department of Agriculture created Special Assistant for Workforce Development

## **WORKER SHORTAGE & DEMAND**

- ▶ SA PA Department of Agriculture (PDA) identified 26+ occupations that will be most in demand for the next 10 years
- ▶ Projected new and replacement job openings in Agriculture and Food Industry from 2015 - 2025 is estimated around 75,000
- ▶ Established a new foundation of knowledge and proactive outreach services

# PDA APPRENTICESHIPS - Agriculture Equipment Service Technicians

- ▶ High School Ag Programs are developing Pre-Apprenticeship Programs
- ▶ Registered Apprenticeships with equipment manufacturers for a new apprenticeship
  - ▶ Collaborating with industry partners to identify training needs and gaps
  - ▶ PDA Certified skill based training leads to micro-credentials

# *agriculture production* **CAREER PATHWAY**

**FARMERS, RANCHERS & OTHER  
AGRICULTURAL MANAGERS**

**FARM EQUIPMENT MECHANICS  
& SERVICE TECHNICIANS**

**VETERINARY  
TECHNICIANS**

**FIRST-LINE SUPERVISORS  
OF AG WORKERS**

**AG EQUIPMENT  
OPERATORS**

**FARMWORKERS**



# Agriculture Center of Excellence

## Walla Walla, Washington

### Established Skills Standards:

- ▶ Agriculture
- ▶ Food processing
- ▶ Natural Resources
- ▶ Irrigation Technology
- ▶ Sustainable Agriculture Education

### Established effective Internship opportunities

- clear practices and protocols for businesses

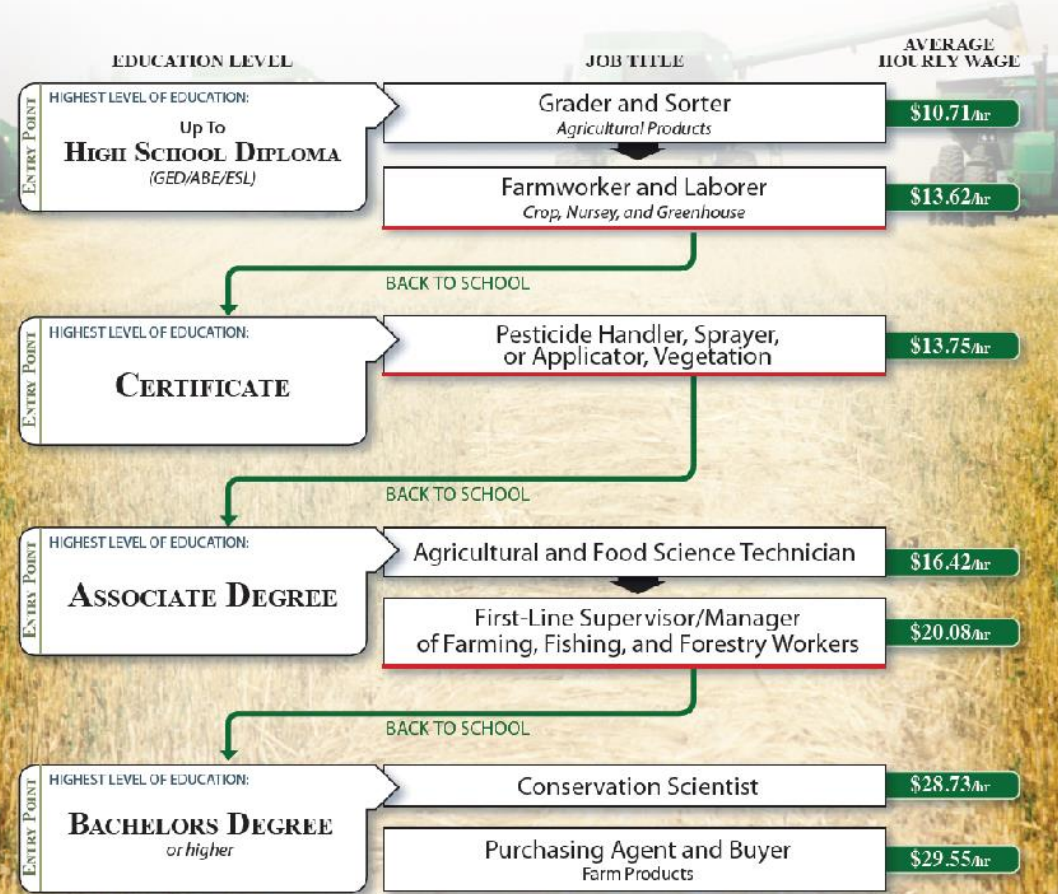
### Career Clusters/ Career Pathways

- ▶ [Big Bend Community College](#)
- ▶ [Clark College](#)
- ▶ [Clover Park Technical College](#)
- ▶ [Edmonds College](#)
- ▶ [Lake Washington Institute of Technology](#)
- ▶ [South Puget Sound College](#)
- ▶ [South Seattle Community College](#)
- ▶ [Spokane Community College](#)
- ▶ [Walla Walla Community College](#)
- ▶ [Wenatchee Valley College](#)
- ▶ [Yakima Valley Community College](#)



# AGRICULTURAL PRODUCTION OPERATIONS

In many career pathways, your highest level of education determines what type of job you can get and how much money you can expect to earn. If you have already progressed to the highest job type for your education level, you may have to go back to school and further your education in order to get a higher-paying job. Use this diagram to reference what kind of job and average wage you can expect for each education level in this career path.



Data used to develop the career pathway diagram was retrieved in January 2011 from Workforce Explorer, [www.workforceexplorer.com](http://www.workforceexplorer.com) for the Agriculture & Natural Resource Career Cluster and recorded by Workforce Development Area. Funding for this project provided by the Washington State Board for Community & Technical Colleges.

# Training Program for Latino Workers - Agriculture Worker Outreach Model

<http://agcenterofexcellence.com/wp-content/uploads/sites/5/2017/04/agriculture-worker-outreach-model.pdf>



# Building Illinois' BioEconomy

## The BIB Consortium -TAACCCT Grant

- Southern Illinois University Edwardsville -
  - Bachelor of Science degree of Integrative Studies
  - Added Fermentation Science to serve subsectors
  - Conducted Industry Needs Assessment
  - Eliminated Out of State Tuition hikes
- ▶ NCERC - National Corn to Ethanol Research Center
- ▶ Work based learning environments
  - ▶ Simulation - virtual training
  - ▶ Internships
  - ▶ Apprenticeships
- ▶ ERTC - Environmental Research and Training Center
  - ▶ Water Quality
  - ▶ Waste Water Management
  - ▶ Process Operations Technician training

# BIB Consortium Partnership

## CLEAR PATHWAYS TO BIOECONOMY CAREERS

### SIUE & 4 Rural Community Colleges

- ▶ Carl Sandurg
- ▶ Lincoln Land
- ▶ Lewis and Clark
- ▶ Southern Illinois  
College

- ▶ BIOPROCESS
- ▶ BIOENERGY
- ▶ PROCESS MAINTENANCE
- ▶ WATER MANAGEMENT
- ▶ RESTORATION ECOLOGY

# Building Illinois' Bio-Economy BIB Consortium Talent Pipeline

Composite Framework

**Regional  
Economic  
Competitiveness**

**CAREER  
EXPLORATION**

6<sup>th</sup> - 8<sup>th</sup> grades  
9<sup>th</sup> - 12<sup>th</sup> grades  
Maker Trailer  
Social media

Soft Skills  
Info Tech Skills  
Tech Skills  
SIC  
ONLINE BioFuels

Soft Skills  
Info Tech Skills  
Tech Skills  
Lewis & Clark

Soft Skills  
Info Tech Skills  
Tech Skills  
Lincoln Land

Soft Skills  
Info Tech Skills  
Tech Skills  
Carl Sandberg

WORK BASED LEARNING  
Internships  
NCERC

Water Quality & Waste Water  
Info Tech Skills  
ERTC

Technical BIOPROCESS  
Science & FERMENTATION  
SCIENCE  
SIUE Integrative Studies

Bachelor Science degree

Articulation agreements

CAREER PATHWAYS

Stacked Credentials

Incumbent Worker  
2+2 Engineering

PROBLEM SOLVING  
TEAM WORK  
COMMUNICATION

Certificates in ...

Associates degrees  
Land Use & Ag Watershed Management  
Process Operations Technology  
Restoration Ecology  
Biofuels

- High School Pathway
- Elearning & Simulation training
- Applied Learning Environments
- Industry Recognized Credentials
- Integrated Digital Literacy Skills

Adult Education

- Advanced Manufacturing
- Industrial Technology

Employers and Workforce Systems Integrated = SECTOR PARTNERSHIPS

Advanced Manufacturing Employment = 21<sup>st</sup> Century Ag Sciences Cluster

# Minnesota's Two Centers of Excellence in Agriculture

## AFNR OPPORTUNITY ANALYSIS - 2016

2 common themes emerged

- ▶ Lack of career awareness
- ▶ Lack of career readiness

# Minnesota Centers of Excellence in Agriculture

1. **Agribusiness Systems**
2. **Natural Resources Systems**
3. **Power, Structural, & Technical Systems**
4. **Biotechnology**
5. **Environmental Services**
6. **Food Products & Processing Systems**
7. **Plant Systems**
8. **Animal Systems**

▶ <https://agcentric.org/what-we-do/career-planning/career-pathways/>

▶ <https://www.agexplorer.com/>

▶ <https://www.agexplorer.com/virtual-field-trip>

# PLANT YOURSELF IN A NEW FIELD!

- ▶ University of Vermont Farmer Training Program  
<https://learn.uvm.edu/program/farmer-training/>
- ▶ **BIB Consortium**  
<http://www.buildingillinoisbio.com/news/index.shtml>
- ▶ Minnesota Department of Agriculture in the Classroom  
<https://minnesota.agclassroom.org/index.cfm>
- ▶ Agcentric Career Pathways - interactive tool  
<https://agcentric.org/what-we-do/career-planning/career-pathways/>
- ▶ Agriculture Center of Excellence, Walla Walla Washington Career Pathway Diagrams  
<https://agcentric.org/what-we-do/career-planning/career-pathways/>
- ▶ Agriculture Worker Outreach Model - Latino Workers  
<http://agcenterofexcellence.com/wp-content/uploads/sites/5/2017/04/agriculture-worker-outreach-model.pdf>

# Direct impact on the economic security of our rural communities

## 1. DATA DISSEMINATION MATTERS

What does the data say about employment in Ag in your state?

## 2. CURRENT AND PROJECTED EMPLOYMENT NEEDS

Which Occupations are in demand in your state?

## 3. SERVING ALL THE SUBSECTORS OF AG

Do all workforce service areas know how to serve Ag employment needs?

## 4. EMERGING FARMERS - WOMEN, ETHNIC GROUPS, IMMIGRANTS

How accessible are Dept of Ag and State resources for emerging farmers?

## 5. Educating teachers, parents and students about Ag Science

How are you marketing career pathways in Agriculture, Food and Natural Resources?

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