


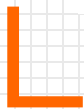
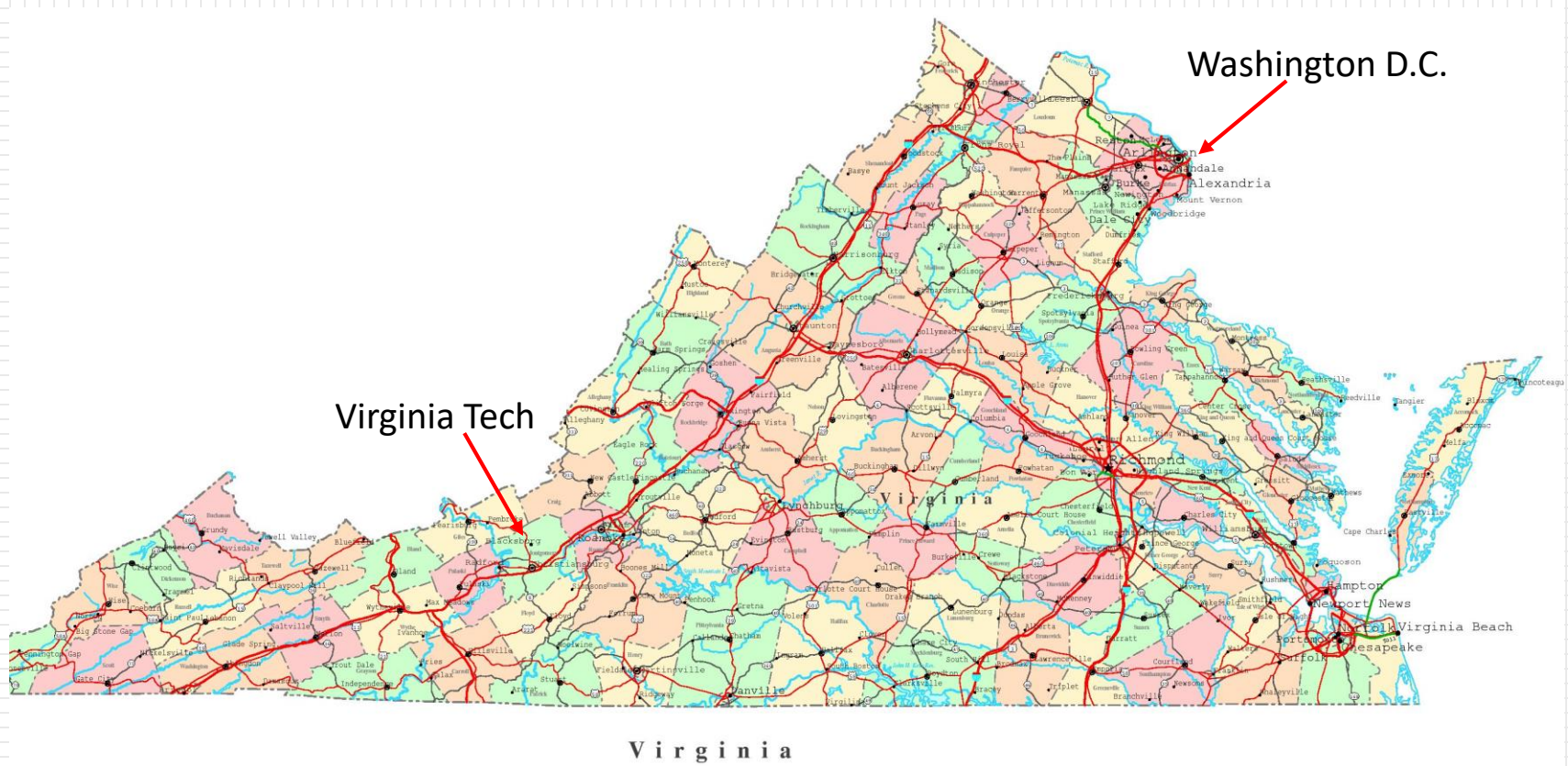
State support for innovation in agriculture—a view from Virginia Tech

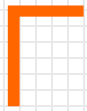


Prof. Tom Thompson
Associate Dean and Director-Global Programs
College of Agriculture and Life Sciences
Virginia Tech

National Research University, Higher School of Economics
Moscow
31 May 2019







Virginia Tech



COLLEGE OF AGRICULTURE AND LIFE SCIENCES
GLOBAL PROGRAMS
VIRGINIA TECH.



Virginia Tech



- A comprehensive U.S. Land-grant university
- 28,000 undergraduates, 6,000 post-graduate students, 1,500 academic staff
- Nine academic colleges, including a Veterinary School and Medical School
- Annually, Virginia Tech has been ranked among the top five to ten U.S. universities for research and development spending for agriculture and life sciences

College of Agriculture and Life Sciences (CAL S)

- Nine academic departments
- More than 3,200 undergraduate students
- 600 post-graduate students
- Annual externally-funded research expenditures of 45-50 million USD
- Eleven Research and Extension Centers throughout Virginia
- Virginia Cooperative Extension has 108 local offices throughout Virginia





CALS Global



The mission of CALS Global is to build partnerships, create opportunities, and empower success, to serve globally.



State Support for Innovation in Agriculture

- Smart Farm Innovation Network
- Enhancing the student experience





SmartFarm
Innovation
Network

Smart Farm Innovation Network

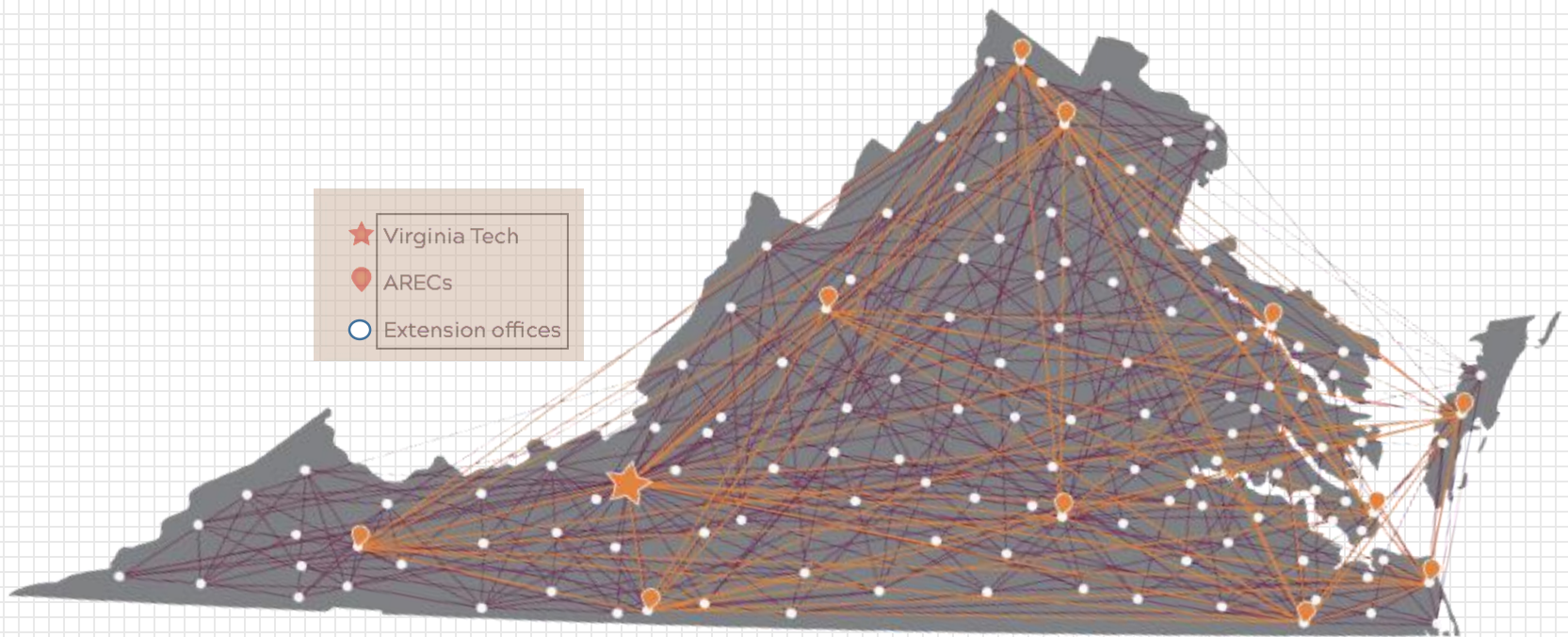
- The Virginia Tech **Smart Farm Innovation Network** is our vision for a state-supported network of **agricultural innovation centers** employing the latest in agricultural technology and **connected** by the most modern data and communication systems.
 - Focus on...
 - strong public-private partnerships
 - development and testing of commercializable technology
 - profitable agriculture
 - student involvement

SmartFarm INTEGRATIONS



SmartFarm Innovation Network

Building a network of interconnected technology centers to spark a new economy



ENHANCING THE STUDENT EXPERIENCE



Taking Stock of Human Capital in Soil Science for Central Asia and the South Caucasus



Nuremgereyev and
Thompson, 2018

http://ecfs.msu.ru/sites/default/files/node/publication/18/11/ca_sc_report_web.pdf

At VT, Bachelor's students can major in...

- Agribusiness
- Agricultural Sciences
- Animal and Poultry Sciences
- Applied Economic Management
- Biochemistry
- Crop and Soil Sciences
- Dairy Science
- Environmental Horticulture
- Environmental Science
- Food Science and Technology
- Human Nutrition, Foods, and Exercise
- Landscape Contracting



Today's Agricultural Technology

CRISPR Genome Editing



www.verdict.co.uk

Today's Agricultural Technology

Artificial Intelligence



www.entreneurship.co.nz



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Today's Agricultural Technology

“Big Data”



startuptales.in/how-big-data-can-help-in-agriculture/

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Today's Agricultural Technology

Autonomous Vehicles



Today's Agricultural Technology

Drones



futurism.com

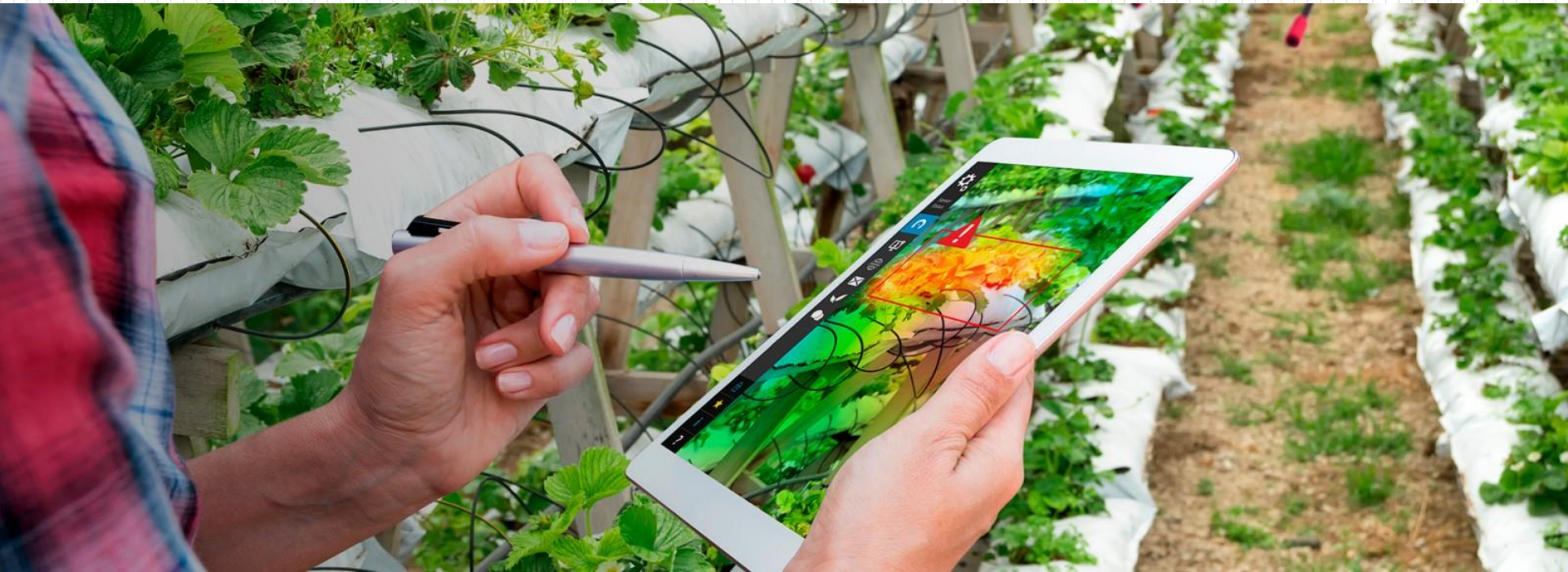
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Today's Agricultural Technology

Biosensors



www.barillacfn.com

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Today's Agricultural Technology

Nanotechnology



www.avensonline.org

Today's Agricultural Technology

Vertical farming



<https://academy.vertical-farming.net/>

Today's Agricultural Technology

Blockchain Technology

THE POTENTIAL OF **BLOCKCHAIN** IN AGRICULTURE



Blockchain is a **ledger system** that allows multiple parties to **securely track actions** and movements of **assets**.



Blockchain can also stem **food fraud**



Improved data sharing can help reduce the **\$1 trillion** problem of food waste.



Blockchain's promise of increased traceability could assist in preventing the spread of food-borne pathogens that cost consumers **\$55.5 billion** per year in the US.

which **costs** the global industry an estimated **\$30-\$40 billion** annually.

Source: Rockefeller Foundation, Ohio State University Michigan State University Gro Intelligence



Today's Agricultural Technology

“Farm to Fork”





Today's Technologies

What will tomorrow bring?

How do we prepare students?





Challenges for Educators



- How do we introduce “cutting edge” topics into traditional classes and curricula?
- How can we be sure that our classes and programs of study are adequately preparing students?
- How do we equip our students to understand and use new technologies in their careers and become life-long learners?
- How do we help our faculty to stay up-to-date on the newest technology?
- How do universities gain access to new technology?



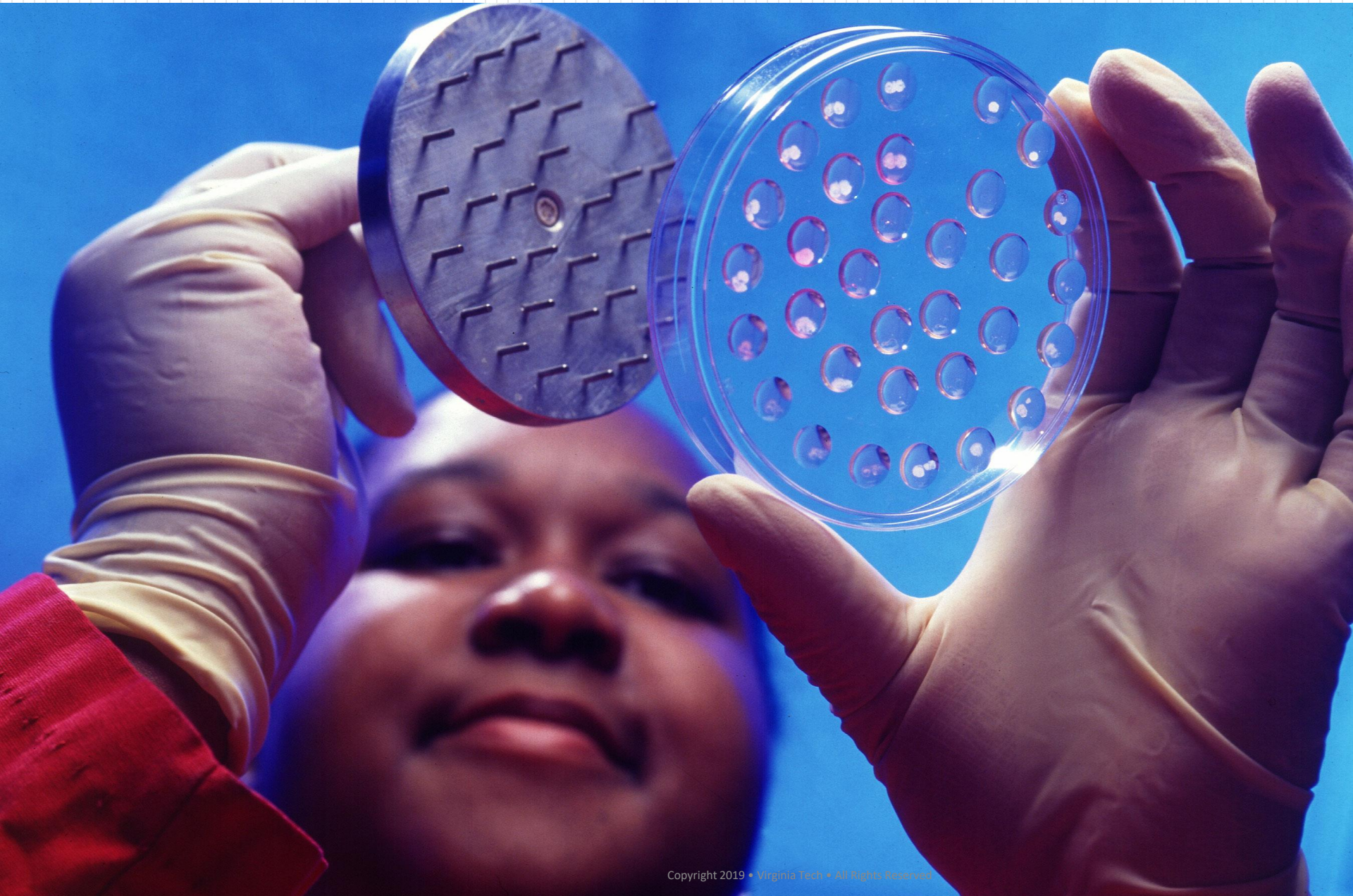


Strategies for meeting this challenge



- Experiential learning, “learning by doing”
 - Undergraduate research
 - Internships
 - Study abroad
- “Flipped classrooms”
- Industry Advisory councils
- Public-private partnerships

Experiential learning—Learning by Doing



Experiential learning—Learning by Doing



Experiential learning—Learning by Doing



Experiential Learning-Study Abroad





Flipped Classrooms

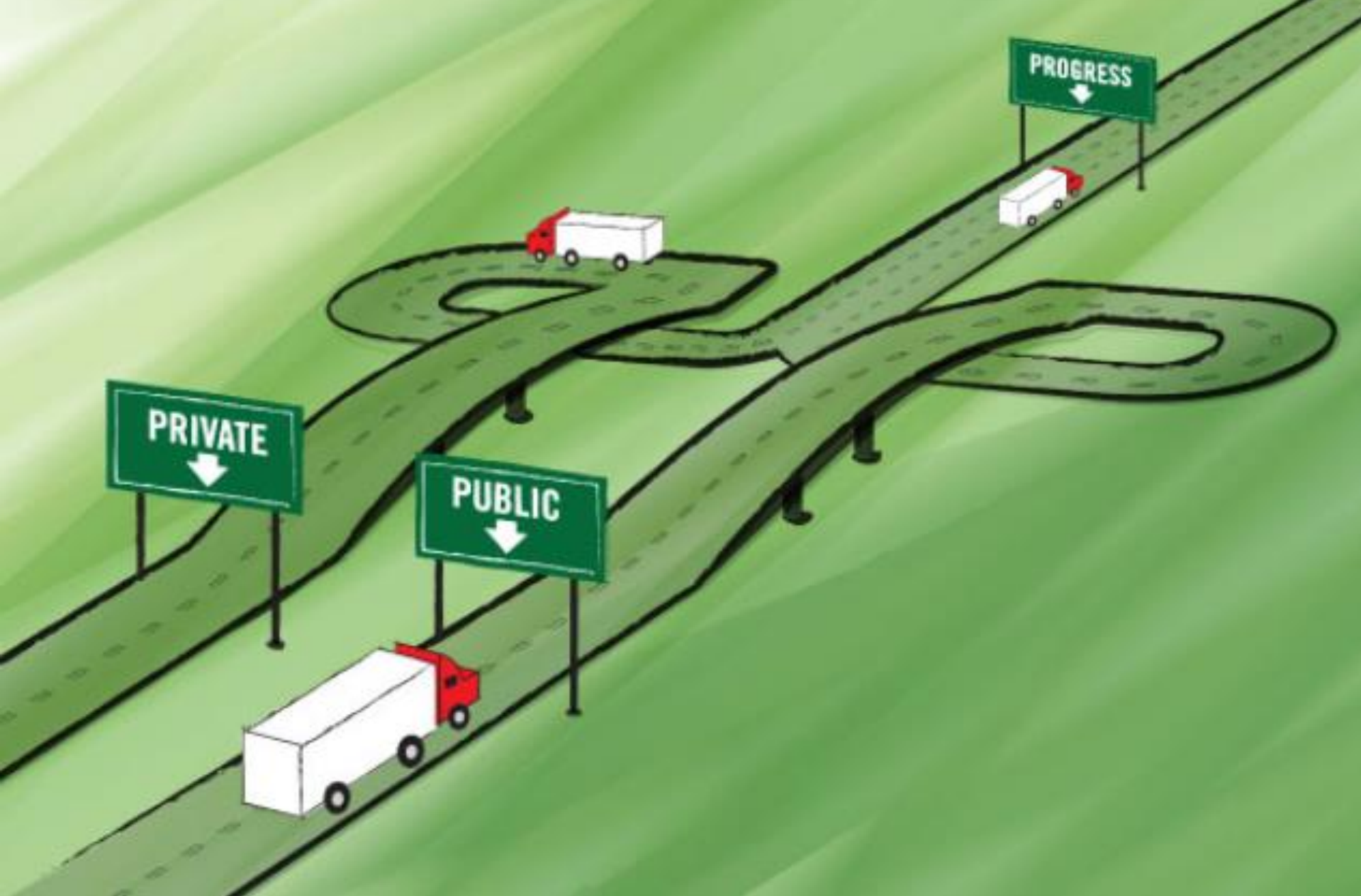


10/17/17



Industry Advisory Groups





Good employment opportunities in U.S.

- *Employment Opportunities for College Graduates in Food, Agriculture, Renewable Natural Resources, and the Environment, United States, 2015-2020:*
 - “An average of 35,400 new U.S. graduates with expertise in food, agriculture, renewable natural resources, or the environment are expected to fill only 61% of the expected 57,900 average annual openings.”
 - However, “...employers will need to look to other areas such as biology, business administration, engineering, education, communication, and consumer sciences to fill the remaining 39% of openings.”
- Therefore, in the U.S., there are major needs and opportunities for universities offering agricultural education.





Conclusion



- It is a time of opportunities and challenges for universities focused on agriculture
- Are we equal to the challenge?

Спасибо!
Tom Thompson
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