WHAT is IMPACT?

WHAT IS IMPACT?

Impact is a *change* in:

- Knowledge
- Behavior
- Condition (economic, environmental, or social)

Change can affect:

- Individuals
- Families, communities
- States, regions, nations…

WHAT IS AN IMPACT *STATEMENT*?

A ***brief summary*** in ***lay terms*** of the ***difference*** a project or program has made

- So what?
- Who cares?

WHY is IMPACT REPORTING important?

WHY IS IMPACT REPORTING IMPORTANT?

- Accountability

- Influences funding and other decisions

- Raises awareness, interest, and support
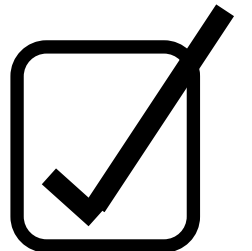
- Catches attention

WHO uses **IMPACT STATEMENTS?**
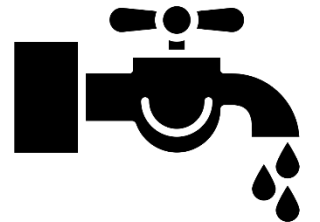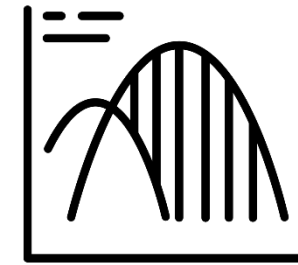
WHO USES IMPACT STATEMENTS?

- Grantors, funders, partners
- University leadership
- Communicators
- Decisionmakers
- NGOs and non-profits
- Industry groups, producers
- Communities, consumers
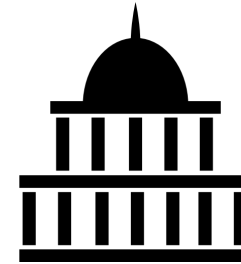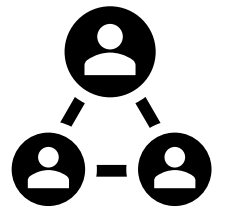
HOW do they use our **IMPACT STATEMENTS?**

NIFA Reporting System

NIFA has established the NIFA Reporting System (NRS) in collaboration with Land-Grant Universities and other partners. This tool provides data management and reporting for capacity funded research projects and Extension programs.

Land-Grant Impacts

Impacts | Search | ⇄ Advanced Options ⌄

⎗ Parameters   ⟳

within the last...   ⌄

s1069   🔍

Institution Based Filters

All Regions   ⌄

All States & Territories   ⌄

All Designations   ⌄

All Institution Types   ⌄

☰ Search Impact Statements Searching Current Impact Statements publicly available in the system.

10 ⇕

💬 Using Drones in Agriculture and Natural Resources

This award-winning multistate team of researchers and Extension educators is developing and promoting the use of drones in agriculture and natural resources. Remote sensing with drones offers a promising new way to monitor landscapes, individual plants/animals, and stressors like pests.

Agricultural Systems

Showing 1 to 1 of 1 records

View our impacts in Oregon counties

View our impacts in Oregon legislative districts

WSU's Lav Khot, colleagues receive multi-state award for ag drone research, extension

Drones aid in farm efficiency across Arkansas, U.S.

by Will Hehemann Special to The Commercial | August 22, 2022 at 3:17 a.m.

U.S. Agriculture

OUTLOOK

2017 EDITION

THE BIG PICTURE

UAVs' POTENTIAL TO
CAPTURE IN-DEPTH AG DATA

PLUS:

The FEDERAL FARM LOAN ACT
and a Century of Support for
American Farmers

Wasting Away

The Food Waste Problem and
What's Being Done to Fix It

INTERVIEW with
Rep. MIKE CONAWAY,
Chairman of the House
Committee on Agriculture

WorldAgNetwork.com

THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION

Return on Investment

A REPORT FOR CONGRESSMAN AUSTIN SCOTT

UGA Cooperative Extension is working hard for your constituents. Here is a small sample of successful projects completed in your district this past year:

Improving tomato production

Scientists from the University of Georgia, University of Florida, Clemson University and North Carolina State University worked together over the last two decades to try to alleviate tomato spotted wilt virus.

The **RAMP (Risk Avoidance and Mitigation Program) Project** compiled data showing an estimated $9 million loss in tomato and pepper crops between 1996 and 2006. Without resistant varieties, Georgia's tomato crop would have been wiped out.

Today, Georgia's vegetable industry, including the state's tomato and bell pepper fields, is worth $781 million and accounts for about 10,200 jobs across the state, according to the most recent *Georgia Farm Gate Value Report*.

Assisting with income tax planning

UGA Extension conducted community outreach tax credit training, and the Colquitt County Extension agent collaborated with local and state groups to implement a **bilingual VITA site** in Colquitt County. Community agencies that participated in the training helped with the tax credit outreach and VITA initiative.

Agencies made their low-income clients aware of the available tax credits and VITA site locations to have their tax returns prepared for free. VITA site volunteers completed 93 tax returns with refunds totaling $158,825, without charge to low- and middle-income taxpayers.

Providing quality drinking water

After a few resident well water samples from Monroe County and the surrounding area tested positive for uranium, local UGA Extension agents and state specialists offered educational programs to raise awareness of the issue and encourage more well water tests.

About **800 wells were tested for uranium**, with 39 wells testing positive for higher levels than recommended.

USDA National Institute of Food and Agriculture
U.S. DEPARTMENT OF AGRICULTURE
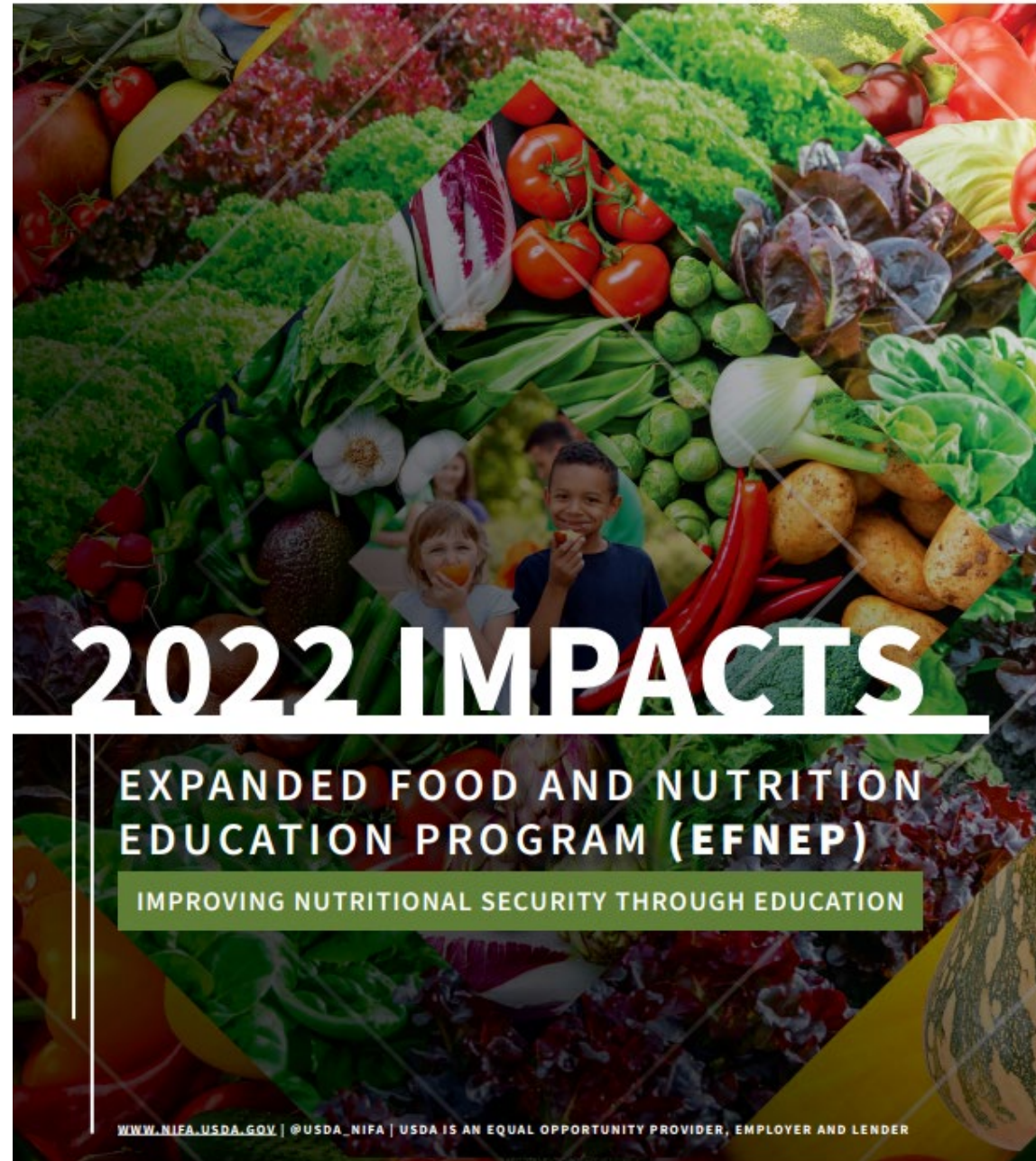
2022 IMPACTS

EXPANDED FOOD AND NUTRITION EDUCATION PROGRAM (EFNEP)

IMPROVING NUTRITIONAL SECURITY THROUGH EDUCATION

Multistate Research Fund Impacts Program
@MRFImpacts

···

It's #FarmersMarketWeek! A team of land-grant universities is helping growers boost sales. For example, workshops helped 900 farmers & farmers market managers set prices for produce. One year later, 75% had increased customer base & sales. bit.ly/Marketing-Prod...

Using Drones in Agriculture and Natural Resources

In order to maximize resilience and productivity, researchers, farmers, and natural resource managers need to know how plants and animals—and landscapes as a whole—are affected by changing environmental conditions and other stressors. This knowledge enables farmers and natural resource managers to respond quickly to stressors with appropriate, targeted mitigation tactics. This knowledge also guides researchers as they breed tougher plants and animals and develop better management practices and tools.

Remote sensing with drones—unoccupied or unmanned aerial systems—offers a promising new way to characterize landscapes, individual plants and animals, and their various stressors; however, regulations, costs, limited research and education, and other barriers have kept drones from being widely used for agriculture and natural resources.

Since 2016, land-grant university researchers and educators have worked to increase adoption of drones for remote sensing and precise management of agriculture and natural resources.

Working together as a multistate project has many benefits.

Regular communication fosters creativity and productivity and primes the group to respond quickly to emerging issues.

With diverse expertise and members in multiple states, this team can test drones in a wide variety of real-world agriculture situations. In contrast, most prior research has focused on drone use in a single field or a specific crop or stressor. Coordination spreads the workload, reduces duplication, and lowers some costs. Sharing information, equipment, and other resources helps overcome the limited capacity of a single institution.

With members at many universities, the team can tackle the lack of education in the classroom and among other researchers and Extension agents.

Multistate Research Fund
IMPACTS

What has this project accomplished so far?

Researchers are improving drone sensing and developing new drone-based systems.

This project continues to evaluate and identify the most reliable, cost-effective, and user-friendly drone platforms and sensors for monitoring and managing stressors in agriculture and natural resources.

To maximize the accuracy of the data collected, project members developed hardware, software, and detailed protocols for calibrating and using drones.

Researchers developed new drone-based strategies that can help:

- Scout pests and diseases in fruit, nut, and row crops and apply targeted treatment. These industries face major pest issues that are exacerbated by declining labor availability and increasing consumer demand for fewer chemical inputs. Drones can help overcome these challenges. *Clemson University, University of Georgia, Purdue University, Washington State University*
- Monitor plant water stress, helping farmers target irrigation. *Clemson University*
- Evaluate the responses of various genotypes to various stressors and identify plants for crop breeding programs. Drones are less labor-intensive, faster, and can screen more plants than manual screening and they are enabling new types of measurements and biological discoveries. *Montana State University, Texas A&M, Virginia Tech, Washington State University*
- Manage pastured livestock. Drones can detect stray herds, create 3D renderings of animals to calculate market value, and assess forage quality. *University of Kentucky, Mississippi State University*
- Monitor water quality on a large-scale. *Mississippi State University, North Carolina State University, Virginia Tech*
- Provide higher resolution data for flood risk models and water resource management. *Auburn University, Mississippi State University, North Carolina State University, Virginia Tech*

New tools help drone users manage the data they collect.

Drone sensing systems can generate a lot of data. Project members developed a user-friendly digital log book for drone operations. Multidisciplinary expertise helped ensure that the log book has the right features for a variety of users. *Purdue University*

Project members are sharing their knowledge about drones.

Over the past five years, project members have shared their knowledge in many ways, including:

- Fact sheets to help stakeholders understand the regulations and licensing required for drone use.
- Workshops on risk management for current and potential drone users. *University of Arkansas, Clemson University, Texas A&M*
- Trainings to help forest land managers use drones for less labor-intensive estimates of timber value. *Auburn University, University of Florida*
- Extension workshops, programs, and materials. *University of Arkansas, Clemson University, The Ohio State University, Purdue University, Washington State University*
- Digital resources like websites, videos, and datasets.
- 100 peer-reviewed publications, the most recent of which have already been cited 85 times.
- A book on drones for vegetation monitoring.
- Industry magazine articles that reached thousands of readers in multiple countries.
- Popular press articles.
- Regional, national, and international conferences.
- Technical sessions at meetings of professional associations, including the American Society of Agricultural and Biological Engineers.

What are the impacts?

This group's multistate, multidisciplinary research and outreach have helped overcome barriers and accelerate broader use of drones in agriculture and natural resources. By efficiently collecting large amounts of data, drones can help guide better decision making, greater advances in plant and animal breeding, and more profitable and sustainable management.

Drones developed for agriculture can also have impacts beyond the field. After a tornado destroyed a nearby Native American historical site, scientists at Stephen F. Austin State University in Texas used drone data to create 3D models of the site. These models will help tribe members reconstruct the site.

WHAT goes into a good **IMPACT STATEMENT?**

QUALITIES OF GOOD IMPACT STATEMENTS

- Focused
  - *Brief,* but *clear*
  - Highlights

QUALITIES OF GOOD IMPACT STATEMENTS

- Focused

- **Do NOT use jargon**
  - *Spell it out*

It's just a mild hyperinsulism due to islet cell hyperplasia with a touch of hepatic insufficiency and glycogen depletion.

QUALITIES OF GOOD IMPACT STATEMENTS

- Focused

- Do NOT use jargon
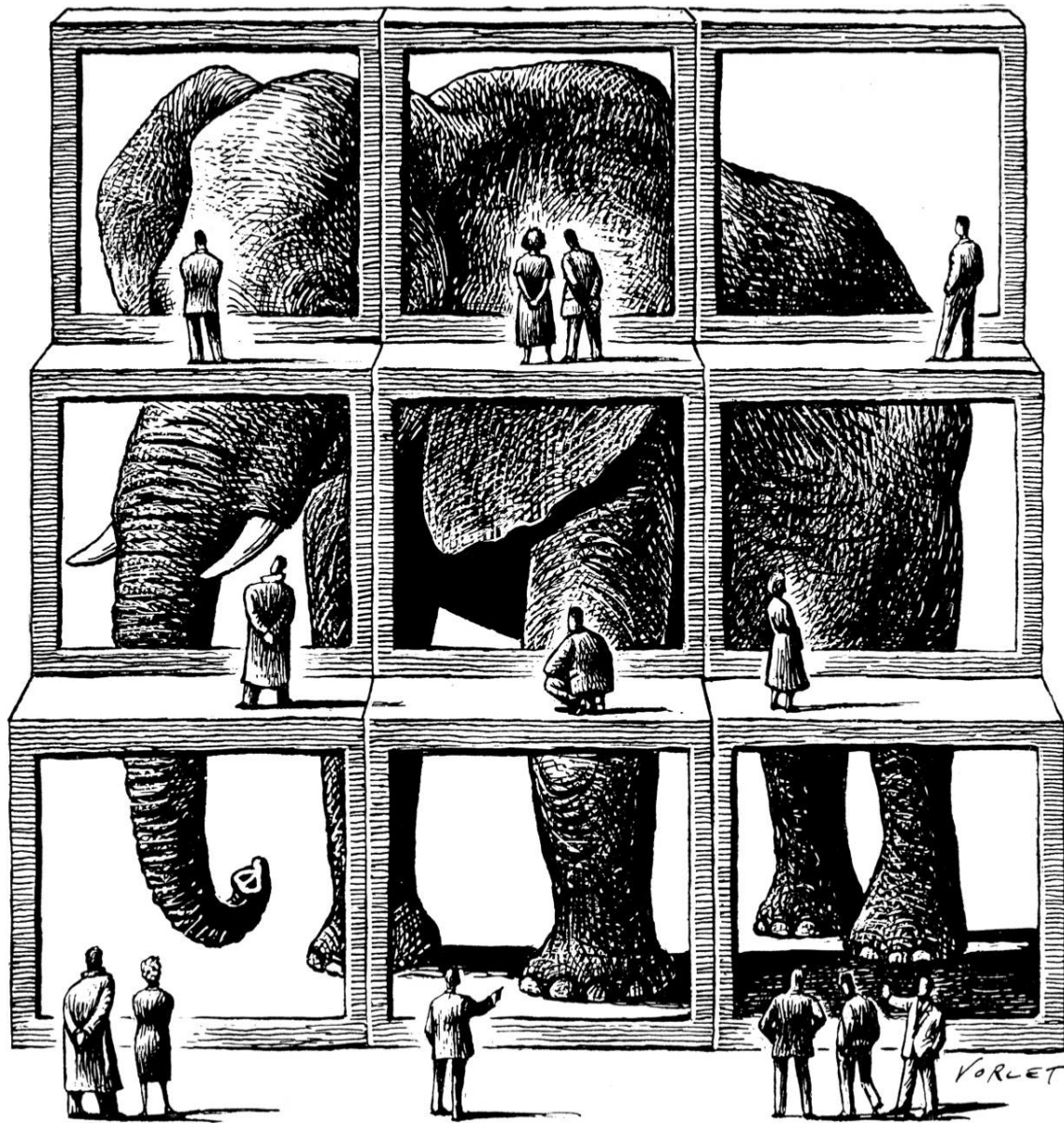
- **Use *active* voice**

QUALITIES OF GOOD IMPACT STATEMENTS

- Focused

- Do NOT use jargon

- Use active voice

- **Provide context**
  - **The *big picture***
  - **A way to *learn more***

THE PARTS OF AN IMPACT STATEMENT

An impact statement connects four main parts:

- Issue
- Action
- Results/Outputs
- Impacts

Terminology may vary
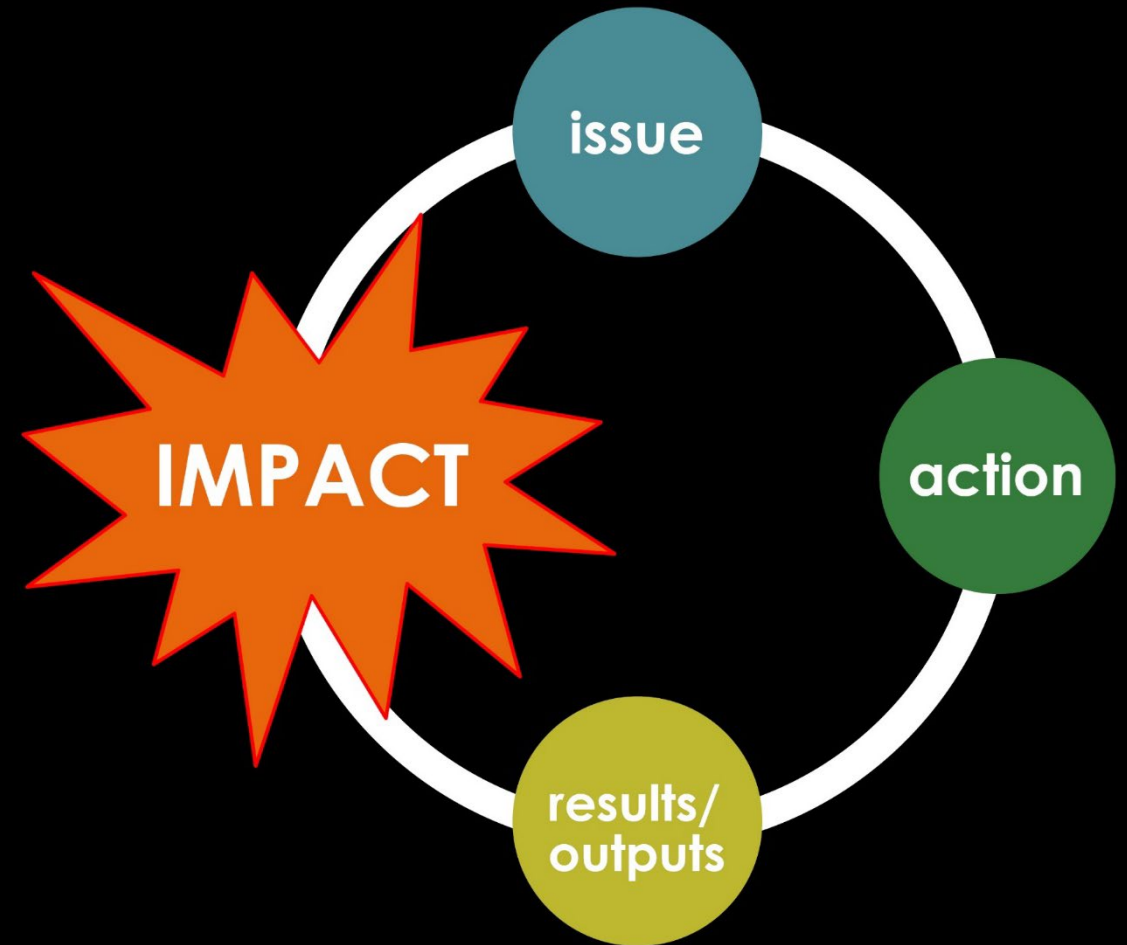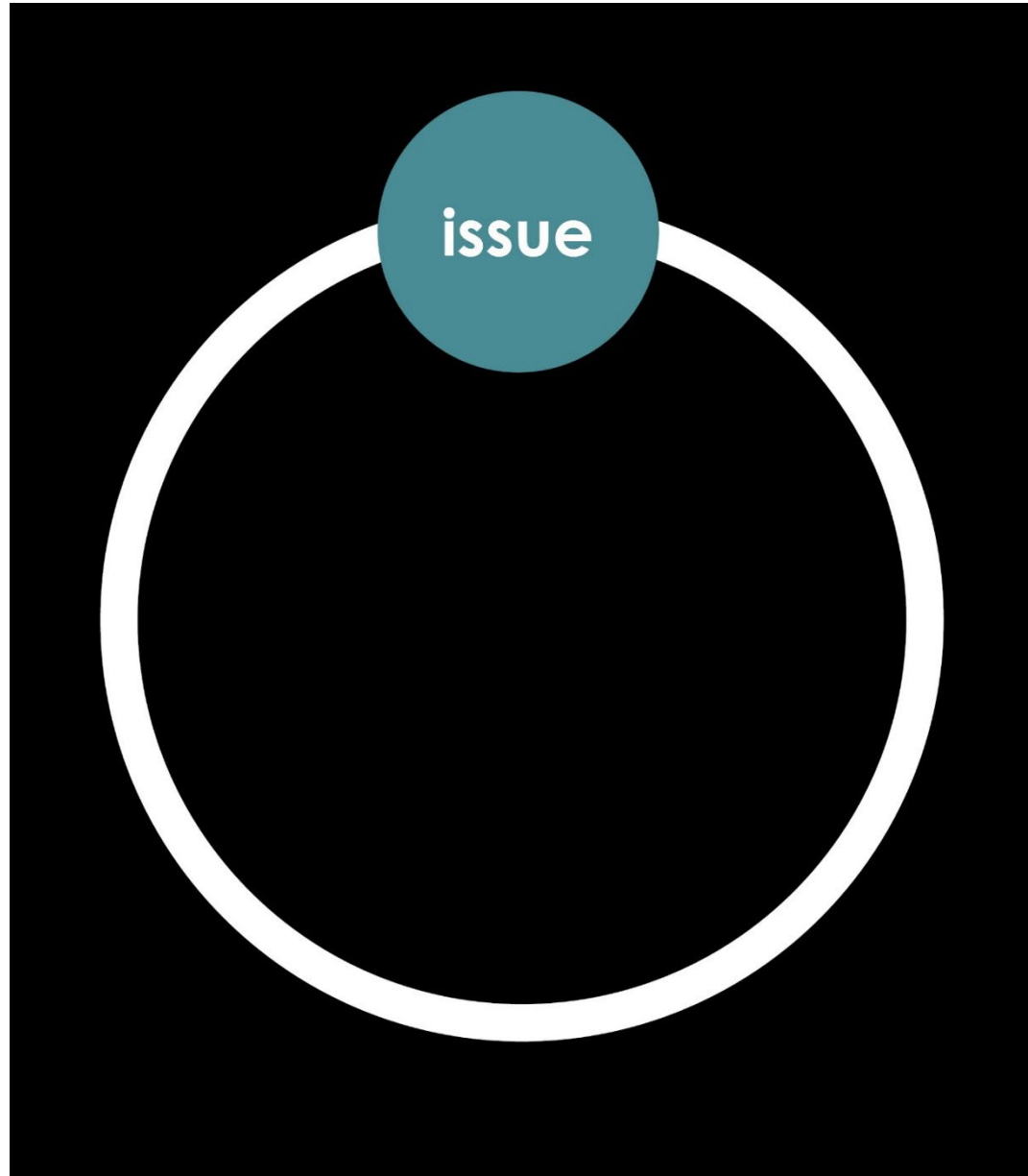
ISSUE

- What?

- Why?

- Who?

ACTION

- What was done?
    - *Align with **objectives***
    - *Highlight **innovation***

- Who was involved?
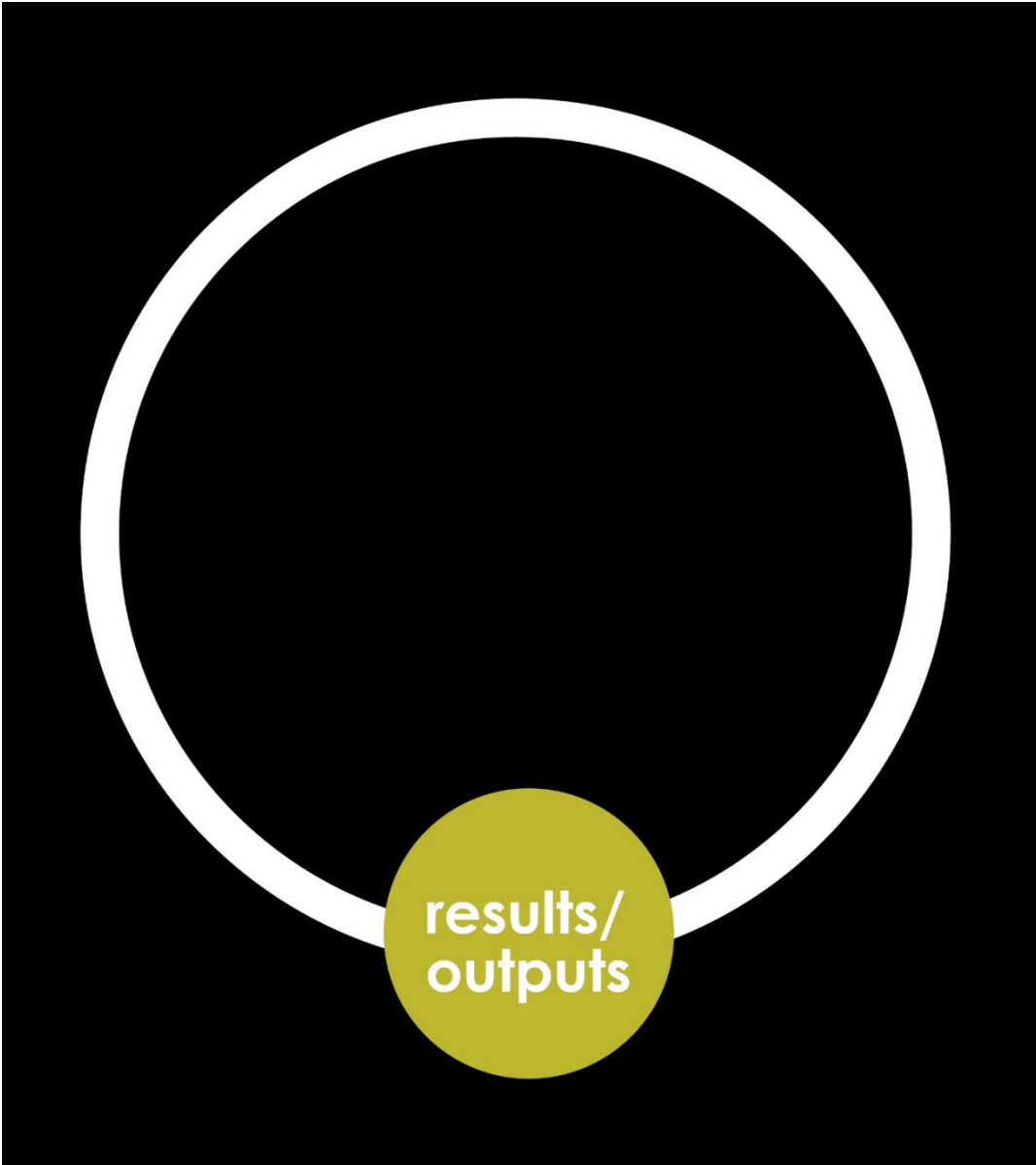
RESULTS/OUTPUTS

- *Major* findings…

- *Useful* products, models, tools, apps, workshops, publications, educational materials, etc…

…that led to change

IMPACTS

- What kind?
- Where?
- When?
- Who?
- How big/much?

PUBLIC VALUE

- **Impact**: can focus on program participants, individuals, study sites

- **Public value:** *general* public, *broader* areas, *entire* communities, *regional or national* economies

WHAT IF
we DON'T have IMPACTS?

POTENTIAL IMPACT STATEMENTS

Show progress toward impact

Use clear language:
- If…then…
- Might, could
- Estimated

Show calculations

PLANNING TO REPORT IMPACT

- Indicators to measure

- Collect data as you go

- Know how the reporting process works

- Work together

HOW TO
format **IMPACT STATEMENTS?**

FORMATTING IMPACT STATEMENTS

- 2-3 sentences per section

- Half-page at most

- Bullets

- Headings, fonts

- Visual aids

- Links, attachments

Environmental Stewardship

PHOTO: USDA

Taking Care of America's Forests

Forests are a critical part of life on Earth. They purify air, filter water, store carbon, provide food and shelter for a diverse array of plants and animals, and produce natural resources like timber, paper and medicine. Forests are also important places for recreation and cultural practices. But forests across the United States are under threat from pests, pathogens, deforestation, climate change, and other stressors. Land-grant university researchers and Extension educators are working to protect forests and the environmental, economic, and social benefits they provide.

Here are a few examples of that work:

- After the 2020 wildfires, many private forest owners in Oregon could not find seedlings or tree planters to reforest their property. Extension educators in **Oregon** have helped about 300 landowners, who need over 3.5 million trees, decide how to prepare their sites, select species and planting density, and plan for maintenance needs. They have also helped track down available seedlings and place orders.

- In Oregon, many landscapes benefit from occasional prescribed fires that reduce the amount of fuel that can feed devastating wildfires. To overcome resistance to and inadequate resources for prescribed burns, Extension educators in **Oregon** helped develop a training that gave forest owners and managers the knowledge and tools to implement prescribed burns and a support network to help carry them out. After the training, the number of planned prescribed burn acres had increased from only a few hundred acres to nearly 10,000 acres.

- Beech leaf disease eventually leads to tree death and should be managed as soon as possible, but infected plants are visually identical to uninfected plants in early stages. Researchers in **Ohio** developed a technique that uses near-infrared light, sensors and artificial intelligence models to determine which leaves are infected. This technology enables rapid response before outbreaks become severe and costly.

Continued

www.landgrantimpacts.org

ABOUT LANDGRANTIMPACTS.ORG | The Land-grant University System is a uniquely American institution and has operated successfully for more than a century. The website documents the collective and individual impacts of the national system of joint teaching, research, and extension institutions.

Prepared by the National Impacts Database writing team, and supported by the Association of Public and Land-grant Universities' Board on Agriculture Assembly. Some projects funded by USDA/NIFA.

ASSOCIATION OF PUBLIC & LAND-GRANT UNIVERSITIES

USDA National Institute of Food and Agriculture
U.S. DEPARTMENT OF AGRICULTURE

02/2023

FORMATTING IMPACT STATEMENTS

- Google/Office templates
- Canva
- Biteable
- Unsplash
- USDA Flickr
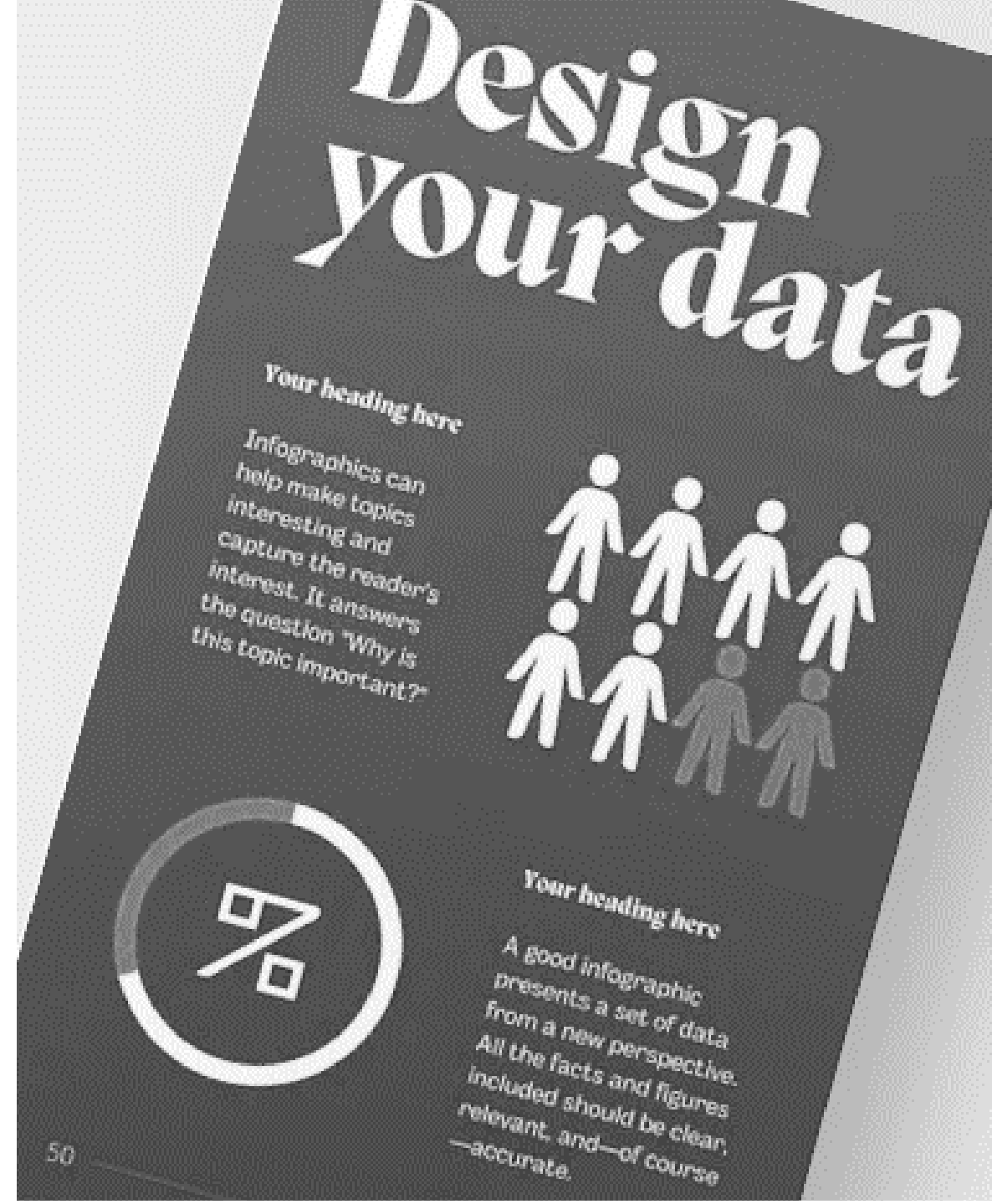
IMPACT
MATTERS.

IMPACT WRITING RESOURCES
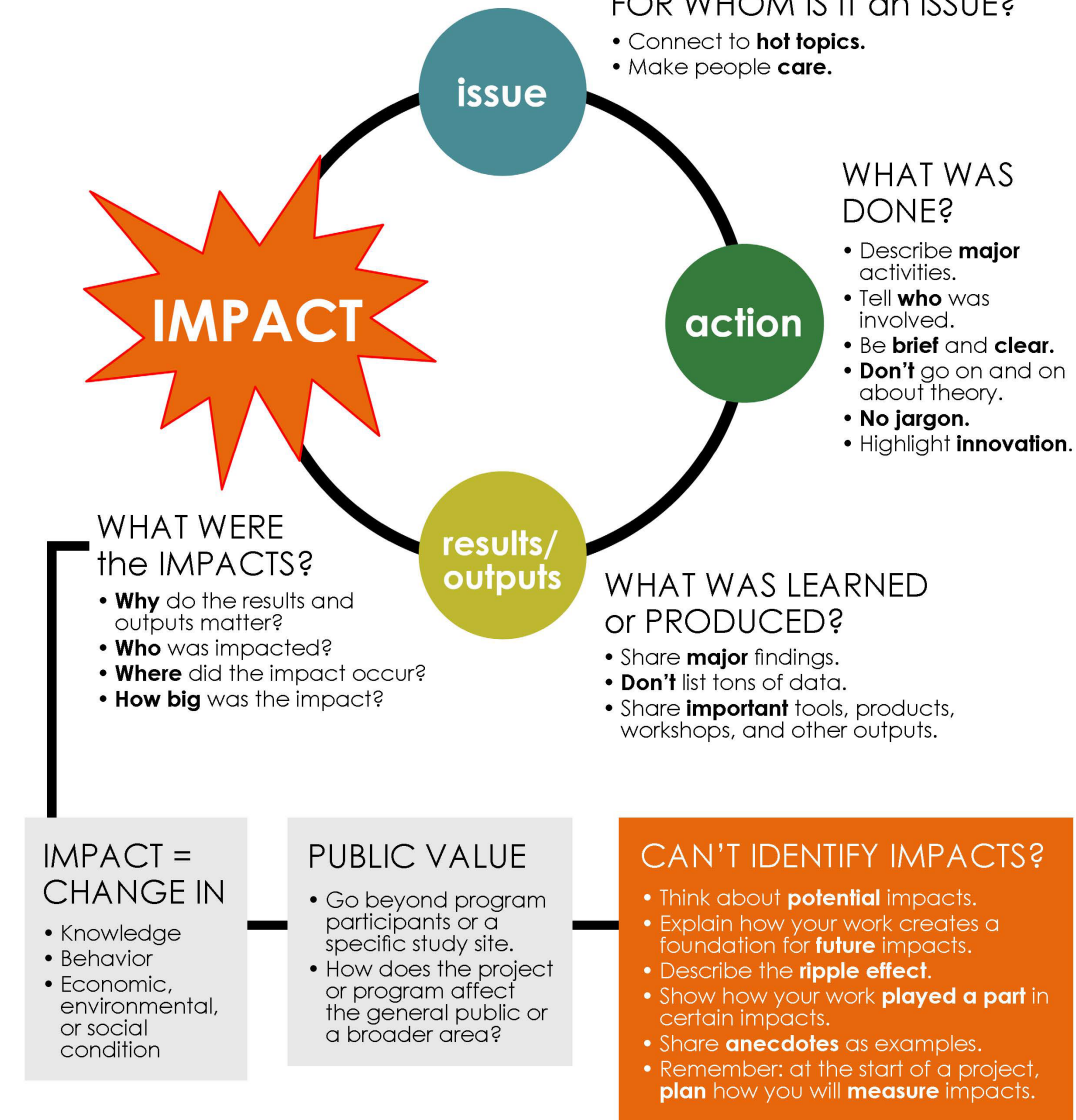
bit.ly/impact-writing

- Tip sheets
- Worksheet
- Video training

LEARN THE PARTS OF AN IMPACT STORY.

Some impact reports or forms use different terms than the ones listed here, but the intent of all impact statements is the same; the basic principles outlined here still apply.

IMPACT

issue

action

results/ outputs

WHAT IS the ISSUE, WHY WAS IT an ISSUE & FOR WHOM IS IT an ISSUE?
- Connect to **hot topics.**
- Make people **care.**

WHAT WAS DONE?
- Describe **major** activities.
- Tell **who** was involved.
- Be **brief** and **clear.**
- **Don't** go on and on about theory.
- **No jargon.**
- Highlight **innovation.**

WHAT WERE the IMPACTS?
- **Why** do the results and outputs matter?
- **Who** was impacted?
- **Where** did the impact occur?
- **How big** was the impact?

WHAT WAS LEARNED or PRODUCED?
- Share **major** findings.
- **Don't** list tons of data.
- Share **important** tools, products, workshops, and other outputs.

IMPACT = CHANGE IN
- Knowledge
- Behavior
- Economic, environmental, or social condition

PUBLIC VALUE
- Go beyond program participants or a specific study site.
- How does the project or program affect the general public or a broader area?

CAN'T IDENTIFY IMPACTS?
- Think about **potential** impacts.
- Explain how your work creates a foundation for **future** impacts.
- Describe the **ripple effect.**
- Show how your work **played a part** in certain impacts.
- Share **anecdotes** as examples.
- Remember: at the start of a project, **plan** how you will **measure** impacts.

EXAMPLES

Impacts

1. **Rumen-protected methionine (RPM) influences the inflammatory process by decreased expression of IL1β, IL6, IL8, PTGES3, MUC1 and SOD1 in bovine cytological smear samples.**

2. …

Determining when peanuts are at the right maturity to harvest is important, but difficult. Significant yield and quality losses can occur if farmers dig peanuts too early or too late. University of Georgia scientists designed the Peanut Pod Blasting Method to accurately determine peanut maturity and the best time to harvest. Using this method, farmers have saved an average of 300 pounds of peanuts per acre and increased gross returns by $60 per acre (based on the 2015 contract price of peanuts). Statewide, that's an extra 173 million pounds of peanuts worth an estimated $35 million.

In 2022, NIFA provided $69.4 million for Land-grant University Cooperative Extension partners to conduct EFNEP in all 50 states, six U.S. territories, and the District of Columbia. EFNEP employed 1,285 educators who worked directly with 187,663 youths.

In West Virginia, youth obesity is higher than the national average, but many families lack access to knowledge about food and nutrition that can help them make healthy choices. As part of the Expanded Food and Nutrition Education Program (EFNEP), instructors led a six-week course to teach 600 high school students in West Virginia about nutrition, meal planning, cooking skills, and food safety. 85% of students showed improved knowledge and skills. One year after the course, a mother reported that her son now helps plan grocery lists, cooks meals at home instead of eating fast food, and is training to be a chef. Over the past year, the family has saved money on food expenses, spent more time together as a family, and had better health reports at their check-ups. "I never dreamed how a simple class could change my family's daily life and future so much and help my wallet at the same time," she said.

EFNEP is supported by USDA/NIFA. Learn more: efnep.org

The specialty crop industry faces issues like worker injuries and poor crop yield. Automated devices can help address these issues, but crops like fruits and nuts require special equipment that individual institutions have not had the resources to focus on. Working together, researchers at land-grant universities designed automated devices that have reduced injuries and boosted crop yield. Below are examples of this work.

IMPROVED CROP YIELD:
- A harvest-assist device designed by Penn State scientists increases the number of apples harvested per second by 50%.
- Farmers said a new mechanized pruning method recommended by Cornell University increased yields by 40% for an additional $400 per acre.

REDUCED WORKER INJURIES:
- 60% of the tomato processing industry has adopted machines designed by University of California to inspect tomato juice. During a single season, the machines eliminate more than 200,000 repetitive motion hazards for workers.
- Penn State researchers designed a harvest-assist device that eliminated ladder falls and reduced the time apple pickers spent in dangerous postures by 50%.

The National Land-grant Impacts Database

NIFA LAND-GRANT COLLEGES AND UNIVERSITIES

The National Impacts Database is a publicly accessible repository for impact statements from land-grant universities.
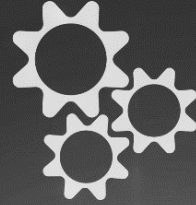
landgrantimpacts.org

Land-Grant
Impacts

Focuses on *impact*

Research *and* Extension

Not *just* NIFA

Anyone can search, anytime

Quality control

Find/assign your inputter

Andrea Putman (aputman@aplu.org)
Kim Scotto (kscotto@aplu.org)

1-2 inputters per institutions

Communicators, evaluators, admins with impact training

Submitting impact statements

ENTER THE DATABASE

s-cummings@tamu.edu

Submitting impact statements

bit.ly/NIDB-tips

bit.ly/NIDB-training

Searching the database

Collaboration.

Innovation.

Communication.

Multistate Research Fund
IMPACTS

# Science and Engineering for a Biobased Industry and Economy

Petroleum and other nonrenewable fossil fuels are commonly used for fuels, energy, plastics, industrial chemicals, pharmaceuticals, cosmetics, and other materials we use on a daily basis. But many of these products can be made using plant compounds, oils, and fiber. Dedicated feedstock crops are an important source of biomass and bioproducts. They can also be derived from food and agricultural wastes like corn stalks, wood chips, and nut and soybean hulls. Recycling agricultural wastes into bioproducts reduces the need for incineration, landfills, and other disposal methods that contribute to global warming and harm human health and the environment. Creating bioproducts from agricultural wastes also conserves land for food production and other needs and provides farmers additional revenue streams.

Biofuels and other bioproducts offer a way to improve energy security, food security, and national security while also cutting back on fossil fuel-related pollution and climate change. Biobased industries can also generate new jobs and economic activity nationwide.

At land-grant universities across America, scientists, engineers, and educators are working together to develop and provide the information, tools, technology, and skills needed to successfully deploy sustainable biobased systems.

The multistate structure provides numerous benefits.

Collaboration allows scientists with diverse expertise and skills to share knowledge and resources. Coordination reduces unnecessary duplication of efforts, and regular meetings help scientists stay on top of innovations and emerging issues. Connection and support also
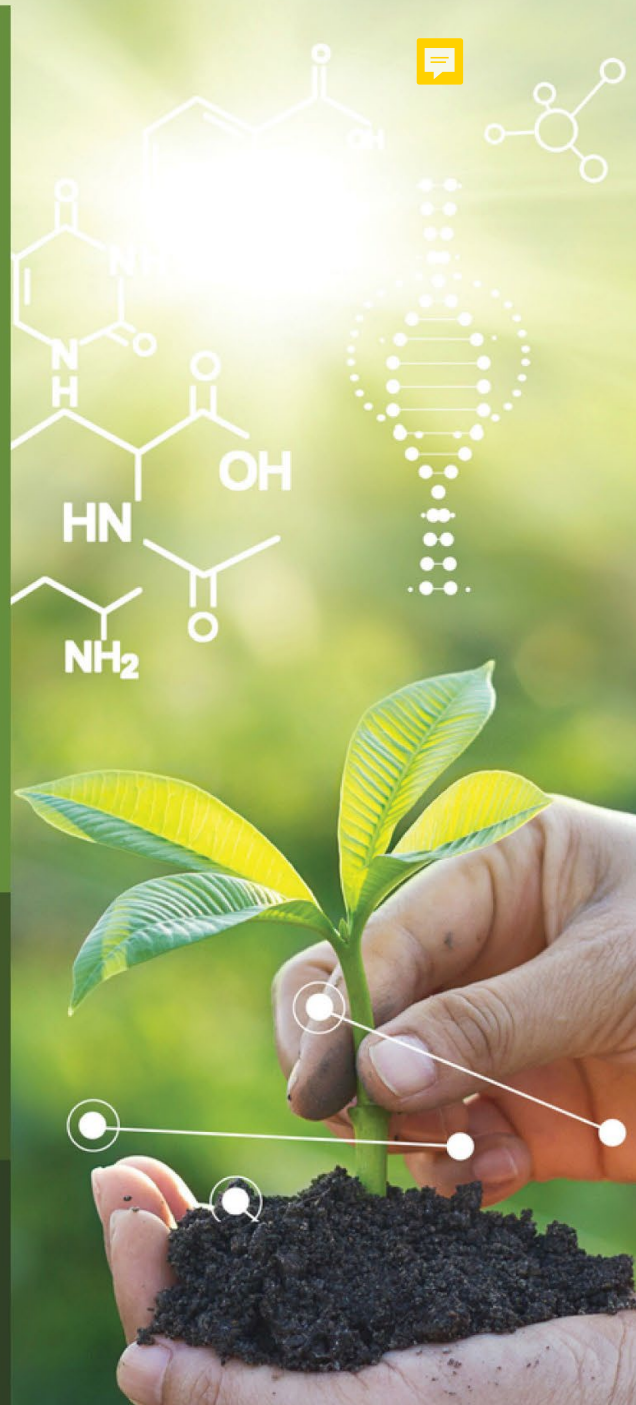
Research Highlights

Researchers enhanced existing biomass feedstock, identified new biomass sources, and developed new bioproducts. For example:

- Low value lactose from large dairy manufacturing sites can be used to affordably produce PHA (a biodegradable biobased plastic with a wide range of applications including packaging films and containers) at commercial scales. *California*
- Pigments extracted from corn can be used as natural food dye that is safer than the commonly used petroleum-based Red 40 dye. *Illinois*
- Researchers extracted and patented antimicrobial compounds from lignin bio-oil. *Kentucky*
- Experiments could result in biobased nanocellulose that can be used to heal wounds. *Virginia*
- Forest residues could be used to create aerogel biosorbents that remove toxic heavy metals from water bodies. *Wisconsin*
- Genetically modified camelina uses nitrogen more efficiently and is more suitable for biofuel production. *Montana*
- Switchgrass and miscanthus can produce high biomass yields on low quality soils. *New York*
- Industrial hemp can be used in numerous bioproducts and has potential to be a major commodity crop in the southern U.S. *Kentucky*
- Duckweed is economically viable for New Jersey farmers. *New Jersey*

Researchers developed technically feasible, cost-effective, sustainable technologies for converting biomass into useful materials and identified reliable, economical systems for producing, storing, and transporting biomass. Specifically, researchers:

- Patented a way to create syngas from municipal solid wastes and switchgrass produces more gallons per year than traditional technologies and would result in an estimated $33 million increase in a biorefinery's annual net revenue. *Oklahoma*
- Developed no-till production systems for sugar beets (commonly used for ethanol) that improve soil health and save farmers about $110 per acre in fuel, machinery, and labor costs. *Montana*
- Identified a new co-fermentation strategy that drastically improves ethanol yield from cellobionate and glycerol. *California*
- Developed a microwave-assisted process that improves the yield and quality of bio-oil and syngas

- Developed techniques to modify lignin so it can replace petroleum in phenols and acrylates, which are used in antiseptics, resins, and more. *Tennessee*
- Identified a process for using plant oil extraction byproducts to create affordable, durable, biodegradable fast food packaging. *Kansas*
- Developed an algal-bacterial process to treat poultry processing wastewater so it is safe to use in hydroponic irrigation. *Alabama*
- Discovered a process that efficiently isolates cellulose nanocrystal and nanofiber from sawdust, prairie cordgrass, and corn stover so it can be used in biopolymers and "smart" fertilizer. *South Dakota*
- Developed new bioprocesses for producing high-value bioproducts from lipid feedstocks, organic wastes, and microalgae. *Hawaii*
- Outlined parameters for successful systems in which brine shrimp convert algae into higher value biomass for bioenergy production. *Missouri*
- Pioneered research on the way brown rot fungi breaks down cellulose, which has been advanced and patented by other researchers at national institutes and labs. *Massachusetts*
- Showed that biochar—the carbon and ash byproduct of heating biomass in the absence of oxygen—can be applied to land to improve soil health and sequester carbon in soil instead of releasing it as a greenhouse gas. *Michigan*
- Showed ethanol biorefineries how to improve long-term profitability by creating allulose (which is used as a low-calorie sweetener) in addition to ethanol during fermentation. *Illinois*
- Calculated that biogas made from anaerobic digestion of animal manure can be competitive with natural gas prices. *Iowa*
- Demonstrated the potential for carbon-negative bioprocessing. *North Carolina*

Models, pilot tests, technical reviews, and other efforts are facilitating the adoption of biobased systems. For example:

- Calculated the life cycle sustainability and costs of new biobased products and processes, which helps policymakers, farmers, and processing companies make decisions. *Michigan, Ohio*
- Helped establish startup companies to commercialize technologies that use agricultural and forestry wastes for bioproducts. *South Dakota*
- Developed commercial-scale systems to help with adoption of gasification technology. *Texas*
- Designed and modeled an algal pond system and a freshwater shellfish pond system that can sustainably produce biomass and biofuels while also capturing carbon; worked with Clemson University facility services to adopt the systems and reduce the campus carbon footprint. *South Carolina*

Workshops, simulations, publications,

What has this project accomplished so far?

Researchers are improving drone sensing and developing new drone-based systems.

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Find stories with your university

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QUESTIONS or COMMENTS?