



United States
Department of
Agriculture

National Institute
of Food
and Agriculture

IPM in an SCRI Context



FOOD PRODUCTION
AND SUSTAINABILITY

BIOENERGY, CLIMATE,
AND ENVIRONMENT

YOUTH, FAMILY,
AND COMMUNITY

FOOD SAFETY
AND NUTRITION

INTERNATIONAL
PROGRAMS

USDA NIFA

NATIONAL INSTITUTE OF FOOD AND AGRICULTURE



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Outline

- General program
- Systems approach in specialty crops
- SCRI-MINDS example



General Program

- First authorized in 2008 farm bill
- Currently \$80 million/yr
 - \$25 million reserved for CDRE
- Fruits and vegetables, tree nuts, dried fruit, horticulture and nursery crops (including floriculture).

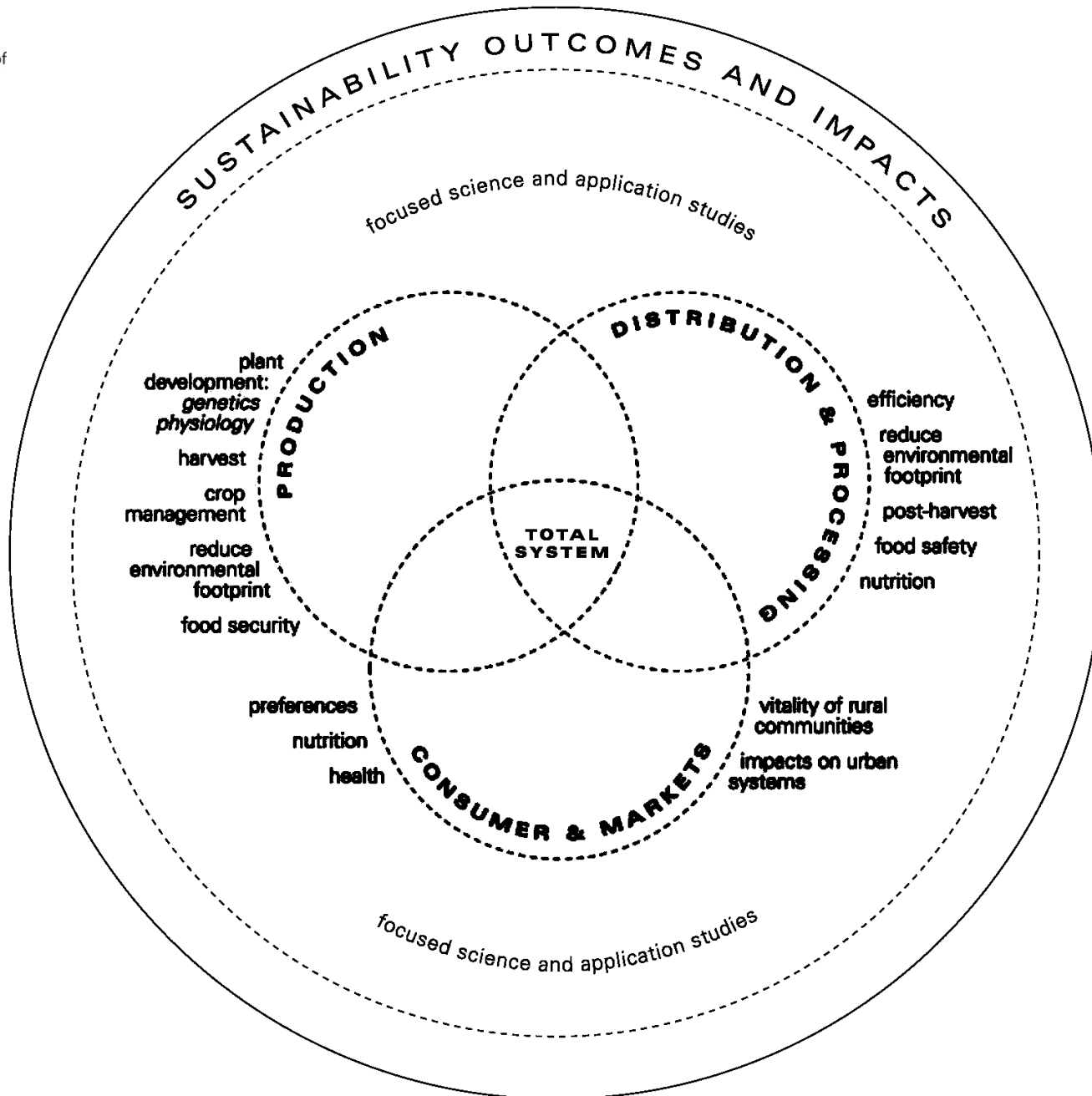


Major Change

- 2014 farm bill mandates NIFA conduct an industry relevance review in developing funding recommendation
- NIFA uses a pre-application process for industry relevance review



A systems approach is any process of estimating or inferring how local policies, actions, or changes influence the state of the neighboring universe. It is a framework that is based on the belief that the component parts of a system can best be understood in the context of relationships with each other and with other systems, rather than in isolation. The only way to fully understand why a problem or element occurs and persists is to understand the part in relation to the whole.





For purposes of the SCRI program, the term trans-disciplinary is defined as a multi-disciplinary approach that brings biological and physical scientists together with economists and social scientists to address challenges in a holistic manner. It is anticipated that successful applications will:

1. Engage stakeholders in collaborative ways to identify those priorities of greatest need;
2. Bring together multi-state, multi-institutional teams of biological, physical, and social scientists to develop strategies and actions emphasizing **systems-based, trans-disciplinary** approaches for meeting the identified priorities;
3. Address priorities through research and extension;
4. Present plans for documenting the impacts of funded applications that include stakeholder involvement; and
5. Include explicit mechanisms to communicate results to producers and the public



The SCRI program has five legislatively mandated focus areas. The legislatively mandated focus areas are:

1. Research in plant breeding, genetics, genomics, and other methods to improve crop characteristics, such as:
 - a. product, taste, quality, and appearance;
 - b. environmental responses and tolerances;
 - c. nutrient management, including plant nutrient uptake efficiency;
 - d. pest and disease management, including resistance to pests and diseases resulting in reduced application management strategies; and
 - e. enhanced phytonutrient content.
2. Efforts to identify and address threats from pests and diseases, including threats to specialty crop pollinators;
3. Efforts to improve production efficiency, handling and processing, productivity, and profitability over the long term (including specialty crop policy and marketing);
4. New innovations and technology, including improved mechanization and technologies that delay or inhibit ripening; and
5. Methods to prevent, detect, monitor, control, and respond to potential food safety hazards in the production efficiency, handling and processing of specialty crops, including fresh produce.



Systems Approach in Specialty Crops

- 50% of cost of production occurs in harvesting and handling
- Appearance is a critical component of quality
- Economic thresholds lower



IPM in SCRI

- Primarily with invasive species
 - SWD (\$12 million)
 - BMSB (\$15 million)
 - Avocado wilt (\$7 million)
 - HLB (\$48 million)



SCRI-MINDS

- Precision Irrigation and Nutrient Management for Nursery, Greenhouse and Greenroof Systems
 - 5 yr; \$6.9 million; John Lea-Cox
 - 21 co-PIs
 - 11 PHD; 4 MS; 9 undergrad
 - 26 FTE



Major Outcome Highlights

- 40 – 70 % reduction in water use
 - One nursery grower saved 43 million gal in 1 yr
 - With 50 % adoption rate and similar water savings, this is enough for 400K households
 - Less energy needed for pumping; 7500 car equivalents



Major Outcome Highlights

- Disease related loses in Gardenia reduced from 30% to 0.
 - Production cycle shortened from 14 to 8 months (fewer inputs needed)
 - 256% increase in annualized profit
- Other diseases, such as Phythopphthora also reduced



Major Outcome Highlights

- Reduction in PGR use
 - Research in poinsettia showed that managed water deficit could replace PGR for height control
 - Plant growth returned to normal when water level increased



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Questions