

Prioritizing research for the evolution of organic agriculture

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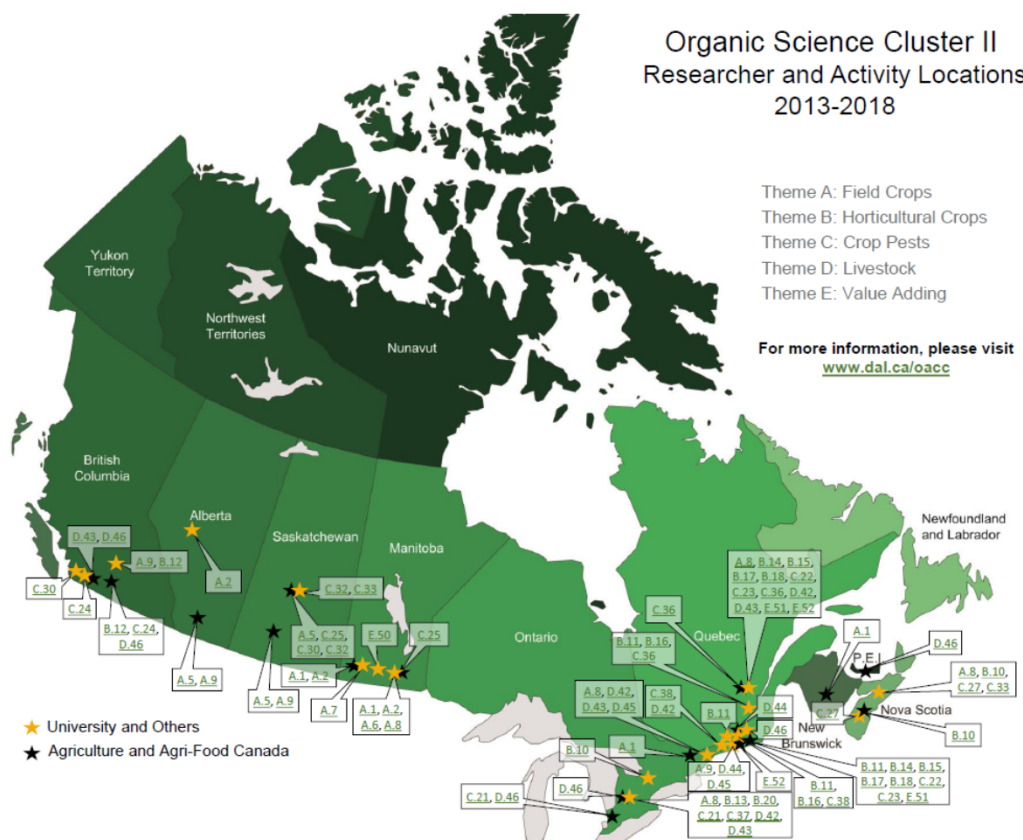
Member of TIPI Council



Organic Science Cluster II 2013-2018



Part of the AAFC Growing Forward Science Cluster Initiative



- 37 research activities
- 135 scientists participating
- 40 research sites including Government, University & Industry (+ on-farm collaborators)
- 65+ industry partners
- Led by the **OACC** & the **Organic Federation of Canada (OFC)**
- \$10.7 million total project

Visit www.dal.ca/oacc



The development of a movement....

1920 →

Pioneers of Organic

1.0

Organic 1.0 laid out how people can healthily nourish themselves whilst protecting the environment & biodiversity.

1970 →

Standards And Regulations

2.0

Organic 2.0 enabled the market for certified organic products to develop and gain a significant foothold in many parts of the world.

2015→

A New Era

3.0

Organic 3.0 responds to the many challenges and opportunities that call for a fresh impetus. **Organic 3.0** food and farming systems are more:

Modified from: Arbenz et al. 2015. Organic 3.0 for truly sustainable farming and consumption. Discussion paper presented at Organic EXPO 2015, South Korea. <http://www.ifoam.bio/en/value-chain/organic-30-next-phase-organic-development>

Statistics: 2013

(Willer and Lernoud, 2015)

- \$72 bil U.S. sales
 - Consumer driven
- 78 mil ha
- 82 countries with organic regulations
- 2 mil producers
- 6 mil ha increase from 2012-2013



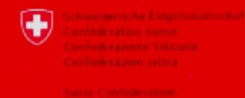
FiBL AND IFOAM

THE WORLD OF ORGANIC AGRICULTURE

STATISTICS & EMERGING TRENDS 2015



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Federal Department of Economic Affairs,
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State Secretariat for Economic Affairs SECO

BIOFACH
into organic





• RICHIUDIBILE
SALVAFRESCHEZZA

• RESEALABLE
POUCH

• BOLSA AUTOCIERRE
GARANTÍA DE FRESCURA

• REFERMABLE
FRAICHEUR GARANTIE

10 pappe

10 servings

10 papillas

10 portions

baby
kiss

BioOrganic



Vit. B1, B2, B6, PP
Ca, Fe

• Instantaneo
• Pront
• Instantaneo
• Instantané



150 g - NET WT. 5.2 OZ.

- Passatino di Lenticchie
- Lentil Creamy Soup
- Pure de Lentilles
- Velouté de Lentilles





您知道吗?



袜口采用弹力纤维, 弹力十足,
不勒脚

3D 设计更适合人们的脚型,
全方位舒适足部

Y 跟设计不磨脚、不滑落, 更
舒适

原料均采用天然彩色棉和
GOTS 国际认证精梳棉纱

手工对目缝制, 减少对脚趾的
摩擦, 更舒适, 更耐穿

有机 健康 舒适 环保



BiOLS

BiorganicLifeStyle



A HAPPY CHOICE



COMMISSION FINANZIATA
DALLA EUROPEA
REGIONI E CONTOLE
SOSTENIBILITÀ

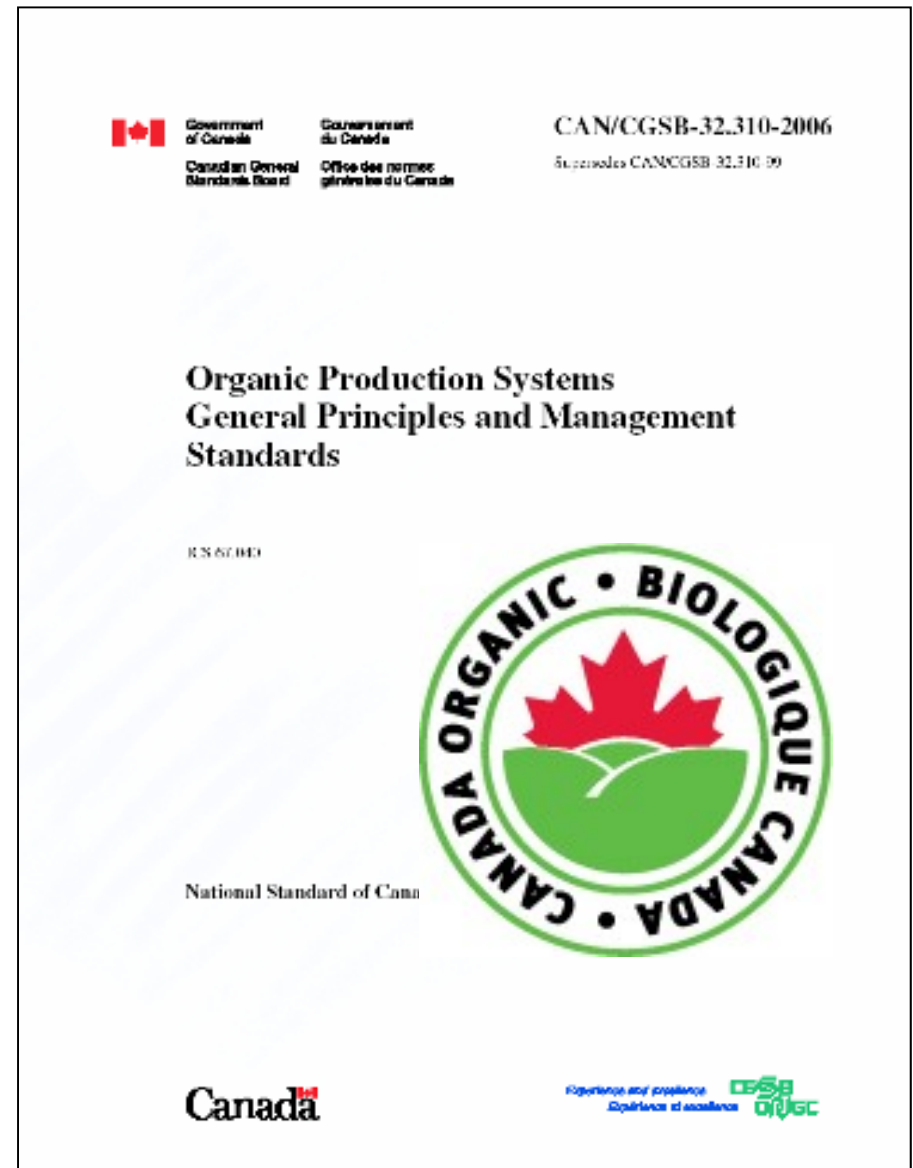


FEDERBIO
FEDERAZIONE ITALIANA DEI PRODUTTORI DI PRODOTTI BIOLOGICI

Organic Agriculture

A regulated system of food production guided by principles and standards of **ecology**, **health**, **fairness** and **care** that were established by producers and processors and driven by consumer demand domestically and internationally.

(Hammermeister)



Statistics: 2013

(Willer and Lernoud, 2015)

- 1% of global ag land and producers (certified)
- 5 of the 6 mil ha increase from 2012 was grazing land in Australia
- Growth in producer numbers has stagnated in Europe and North America
- Increase in production not matching market growth



FiBL AND IFOAM

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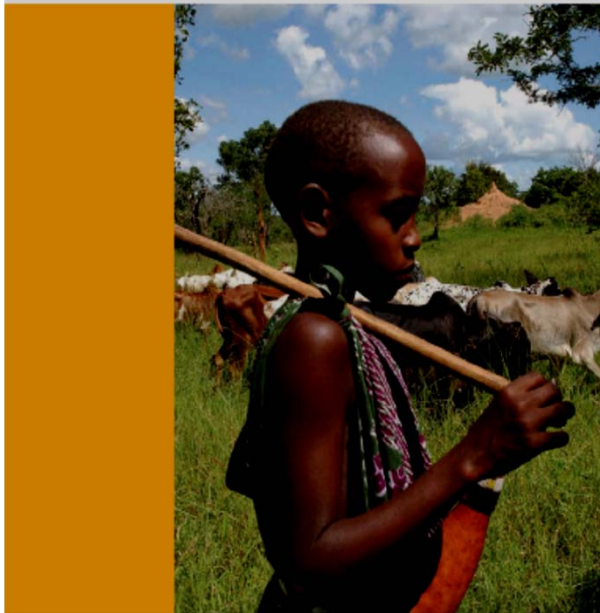


Agricultural pollution



Biodiversity for Food and Agriculture

Contributing to food security and sustainability in a changing world



WORLD FOOD DAY:

More than 925 million people are hungry

www.Agricorner.com

Global issues

FARM ASSURANCE SCHEMES & ANIMAL WELFARE

CAN WE TRUST THEM?



An Animal Welfare Analysis of Major UK Farm Assurance Schemes
Compassion In World Farming Trust
2002

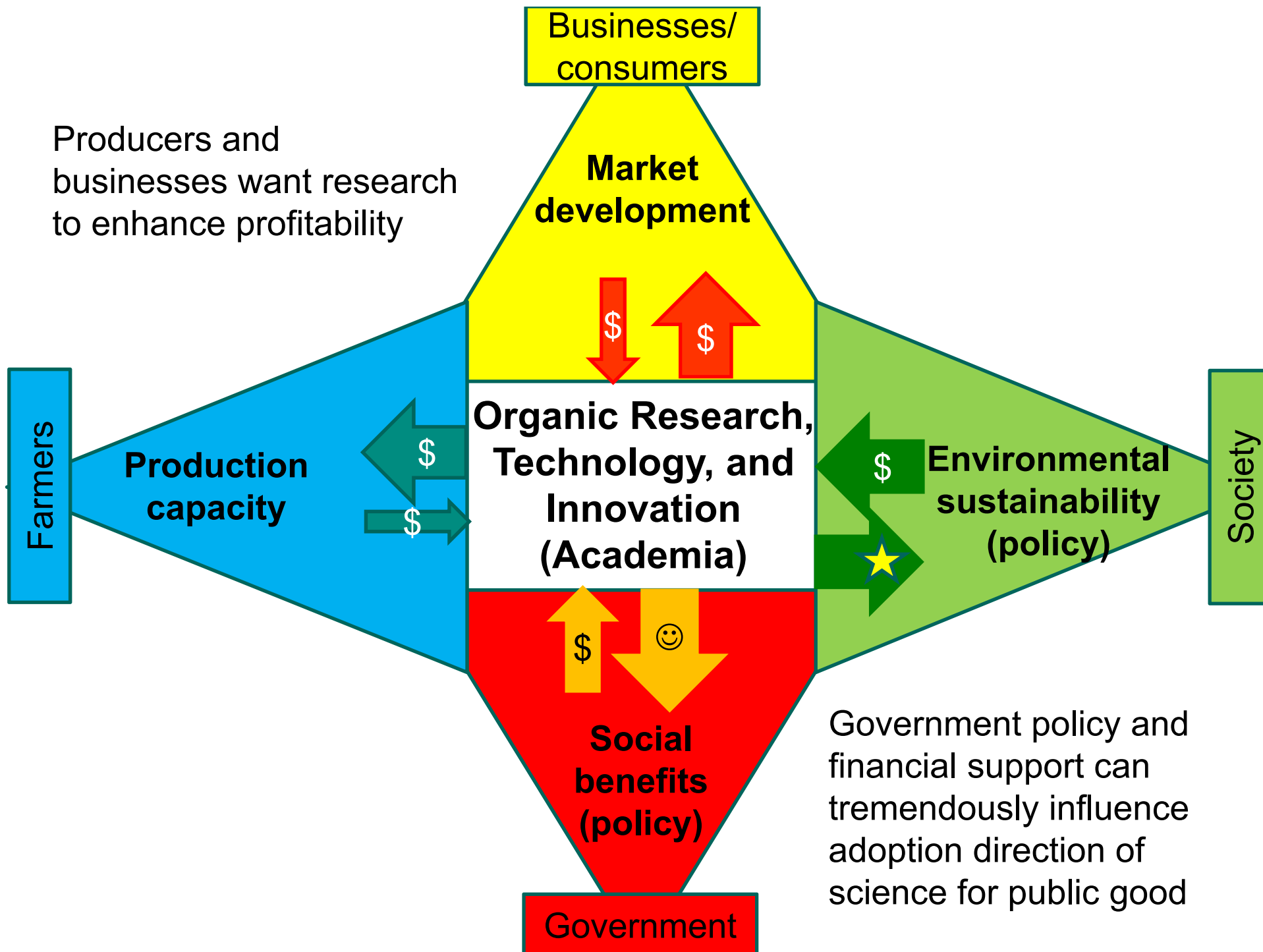
Resource depletion



Climate change





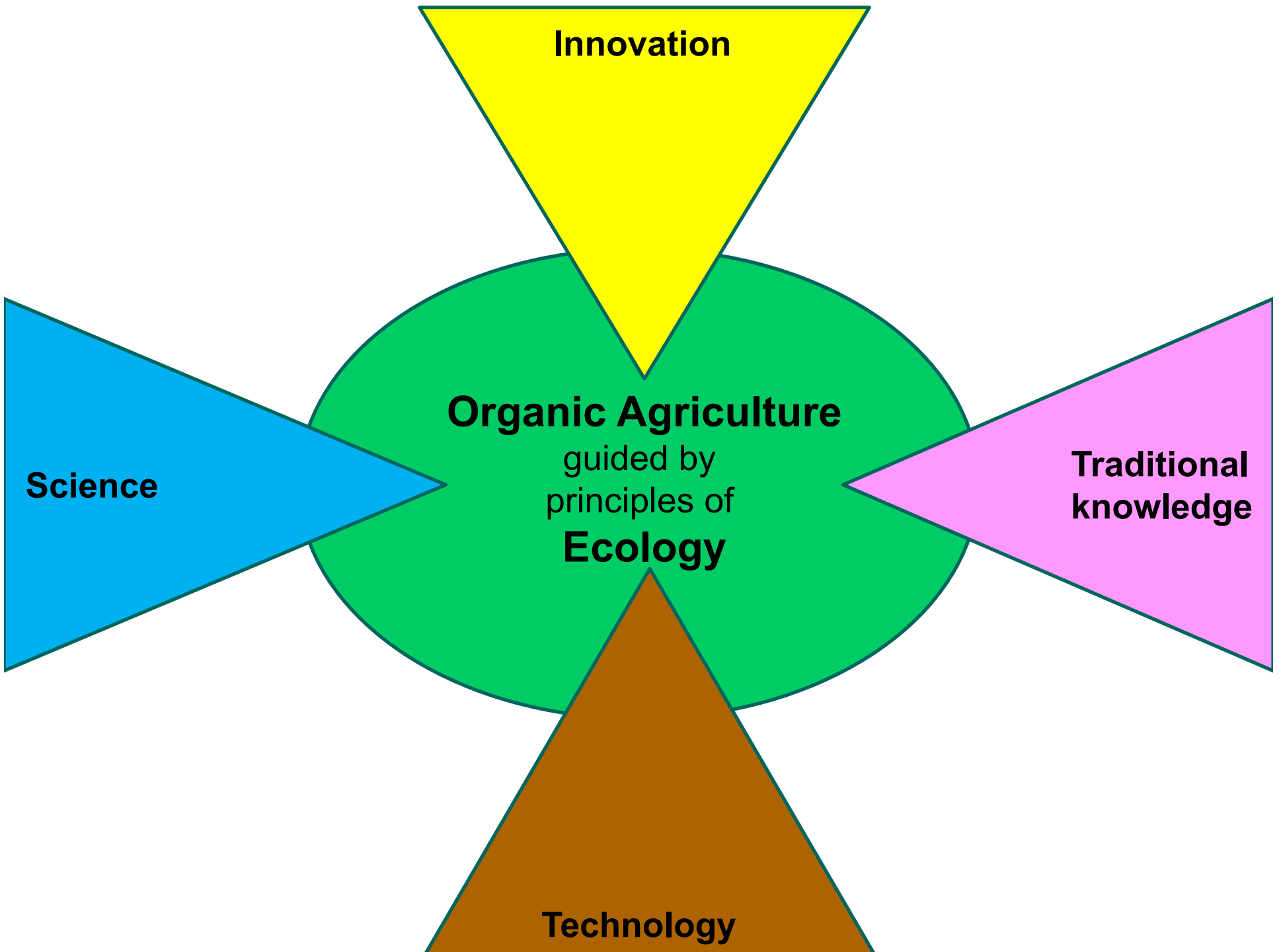


200

**What are your research
priorities?**

Discussion process

1. Break into focus groups
2. Identify a note taker
3. Brainstorm possible questions (15 min)
4. Identify top 5 questions
5. Provide justification for your questions
6. Submit your suggestions
7. Continue the conversation with colleagues, producers, etc.



Businesses/
consumers

Prioritizing research

Farmers	Increase profitability and profit stability for farmers	Society
	Increase yield	
	Provides farmers with new tools to improve efficiency and yield	
	Improves quality of life for farmers and farm workers	
	Increase production and availability (reduce cost)	
	Improve product quality (pest control, storage condition, shelf life)	
	Increase value of product (processing, novel uses)	
	Enhance animal welfare	
	Environmental goods and services	
	Inform policy makers; supports policy and standards development	
	Supports evolution of organic agriculture (locally, nationally, globally?)	
Considerations		
Cost and time to complete research and have results implemented		
Likelihood of success, feasibility of the research, research capacity		
Government		

WAKE UP BEFORE IT IS TOO LATE

**MAKE AGRICULTURE TRULY SUSTAINABLE NOW FOR
FOOD SECURITY IN A CHANGING CLIMATE.**

**(United Nations. 2013. United Nations Conference On Trade and
Development)**

**“The world needs a paradigm shift in
agricultural development: from a “green
revolution” to an “ecological
intensification” approach.”**

Organic Science Cluster II: Vision

Science and innovation enables organic agriculture to thrive in Canada

Objectives

1. Intensify organic production in an ecologically sound manner
2. Identify solutions to pest problems by applying our understanding life cycles to management practices
3. Increase profitability and competitiveness by developing value-added options and technologies



Environmental benefits

“Organic farming system attributes

(cropping, floral, and habitat diversity; nutrient intensity; soil management; and energy and pesticide use etc.)

are sufficiently distinct as to impart potentially important environmental benefits...”.

Derek Lynch (2009); Lynch et al. (2011,2012)



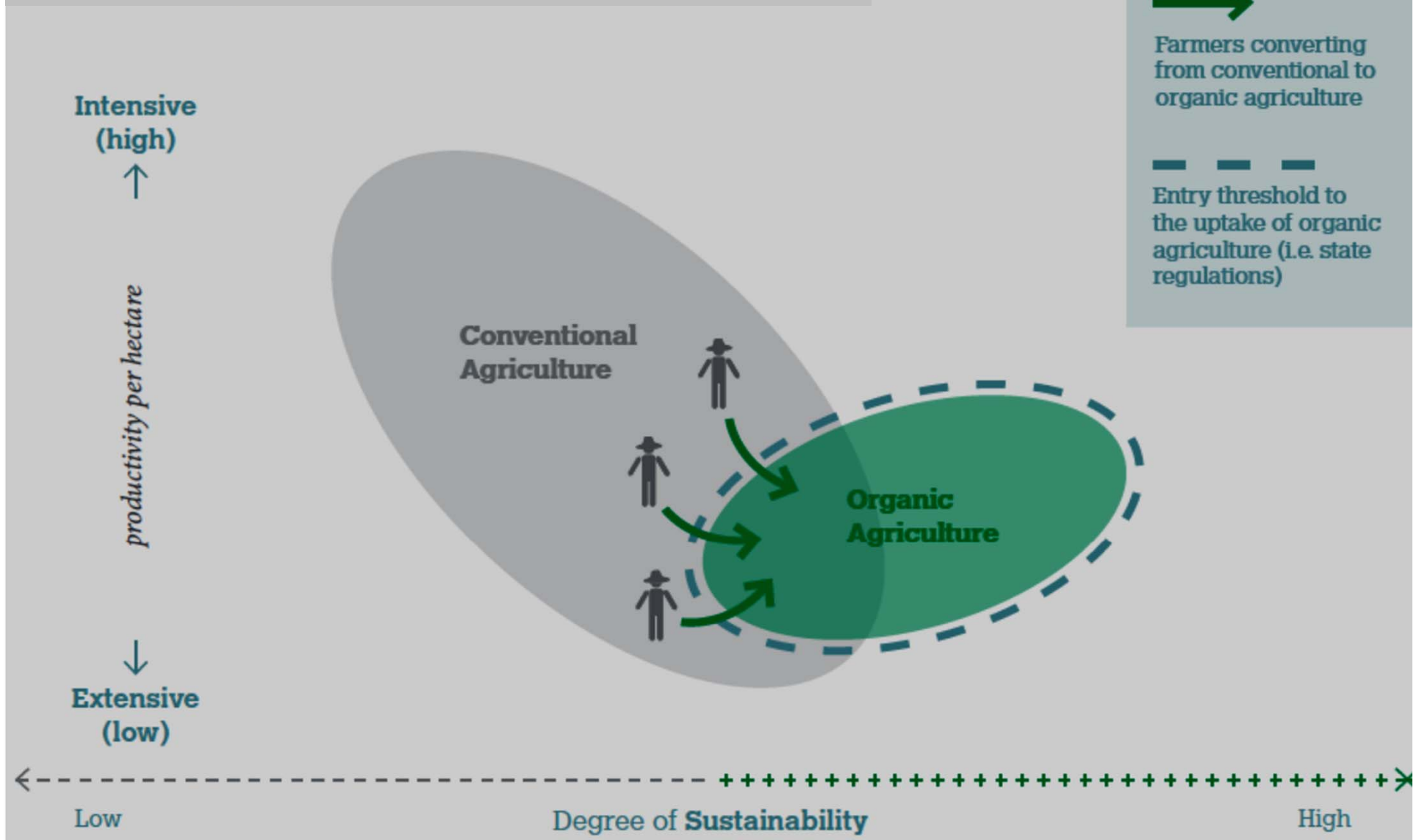
New evidence for significant and nutritionally relevant composition differences

Beranski et al. 2014. British Journal of Nutrition 112: 794-811

- Meta-analysis of literature – 343 peer-reviewed papers
- Organic foods:
 - Antioxidant concentrations 18-64% higher
 - Cadmium concentrations 48% lower
 - Nitrate 30% lower, Nitrite 87% lower
 - Pesticide residues 4x lower
 - Limited other statistically significant differences
- See: <http://research.ncl.ac.uk/nefg/QOF>



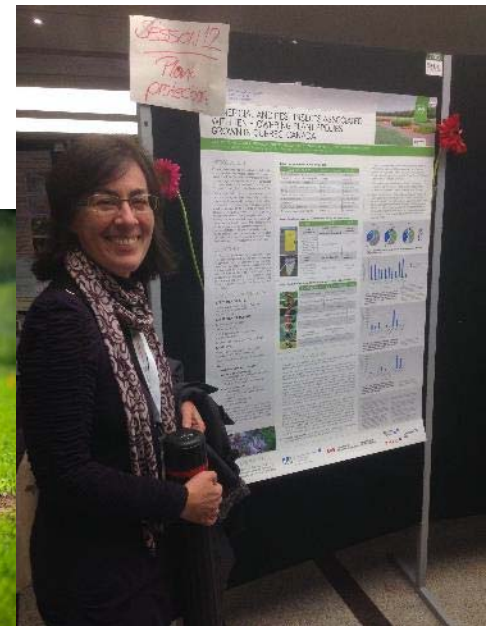
Intensification in Agriculture



Arbenz et al. 2015. Organic 3.0 for truly sustainable farming and consumption. Discussion paper presented at Organic EXPO 2015, South Korea. <http://www.ifoam.bio/en/value-chain/organic-30-next-phase-organic-development>

Research Priorities?

- › Cost of production, increase production efficiency
- › Life cycle analysis of systems
- › Complete innovation pathways (field to fork)
- › Eco-functional intensification
- › Locally/organically adapted plant breeding
- › Novel forage utilization (essential to sustainability)
- › Plant protection innovation
- › Livestock health protection, breeding
- › Nutrient management

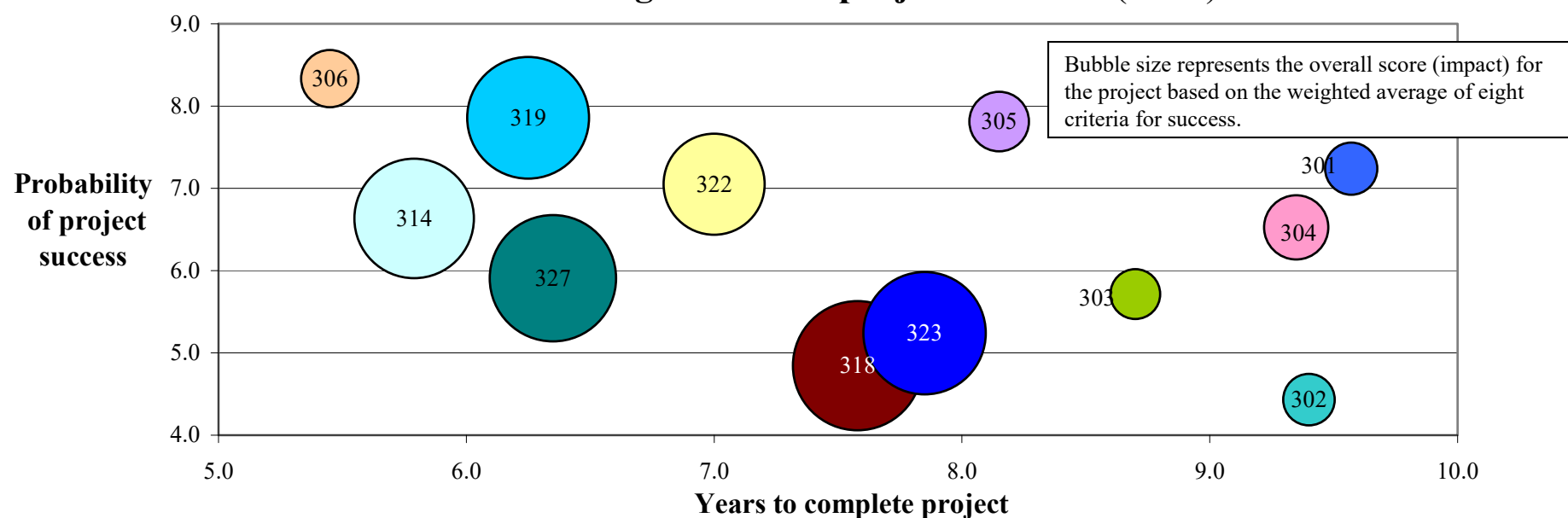




The Strategic Research Process

- 1. Trend analysis**
- 2. Opportunities and Threats**
- 3. Strengths and Weaknesses**
- 4. Farmer and stakeholder survey**
- 5. List of potential research questions**
- 6. Establishing criteria for success**
- 7. Rating the research questions against criteria**
- 8. Inventory of organic research**
- 9. Prioritizing based on impact, likelihood of success and cost/time**

Prioritization of organic sector projects - Plants (n=37)



- 318- FR 5/20 Develop cultural practices to activate induced systemic resistance in crops. (impact = 13.4)
- 327- FR 2/20 (QC) Refine soil fertility management systems to minimize weed pressure. (impact = 13.1)
- 323- FR 19/20 (QC) Identify or develop weed control products with at least 80 percent efficacy. (impact = 12.7)
- 319- FR n/a Develop insect pest thresholds for organic management systems. (impact = 12.7)
- 314- FR 18/20 (QC) Analyze the risk of overuse of copper or sulphur fungicides and explore potential alternatives. (impact = 12.4)
- 308- QC Determine the cost of production associated with different organic vegetable farming practices. (impact = 11.0)
- 322- FR 3/20 Investigate weed seed bank dynamics under organic management systems. (impact = 10.5)
- 309- FR n/a Determine the effectiveness and economics of seed coatings including micronutrients, growth promoters and/or mycorrhizae. (impact = 9.5)
- 304- FR 4/20 Identify long-term cropping systems and/or rotations with higher yield and economic stability under variable climatic situations. (impact = 6.7)
- 305- FR 1/20 Develop intercropping systems, crop sequences & cropping practices with pulse crops & other legumes to increase N fixation. (impact = 6.2)
- 306- FR n/a Conduct a detailed analysis of legumes in organic farming systems RE: strengths, weaknesses opportunities and threats. (impact = 6.0)
- 301- FR 12/20 Identify or develop crop cultivars and/or crop traits for organic management with a five percent yield advantage. (impact = 5.5)
- 302- FR 12/20 Develop perennial grain varieties for organic management systems. (impact = 5.4)
- 303- FR 1/20 Develop crop cultivars and/or rotations that reduce phosphorus requirements by 20 percent but remain economically viable. (impact = 5.2)

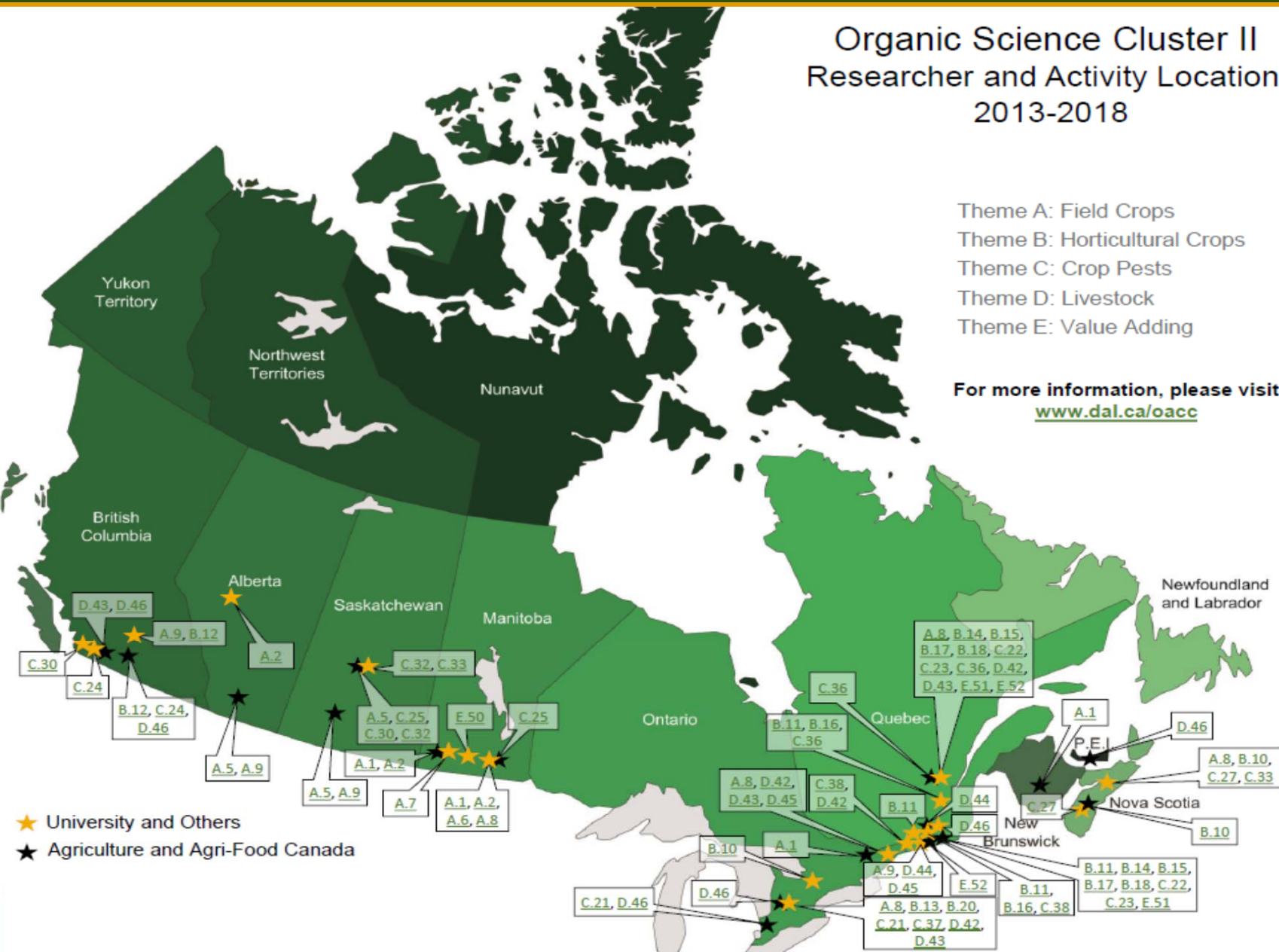
*FR entries in the legend refer to farmer rankings identified by the Final Results of the First Canadian Organic Farmer Survey of Research Needs in 2008

† QC entries in the legend refer to priority projects identified by the Organic Agriculture Committee of the Quebec Agriculture and Agri-Food Reference Centre

Organic Science Cluster II Researcher and Activity Locations 2013-2018

Theme A: Field Crops
Theme B: Horticultural Crops
Theme C: Crop Pests
Theme D: Livestock
Theme E: Value Adding

For more information, please visit
www.dal.ca/oacc



For research to support the evolution of organic agriculture it must have:

- Clearly defined goals
- Support and influence of government (for public good research)
- The interest and collaboration of industry stakeholders
- Scientific capacity to do the research
 - University level training for students in organic ag.
- Cooperation among scientists

For more information on OACC:

www.dal.ca/oacc

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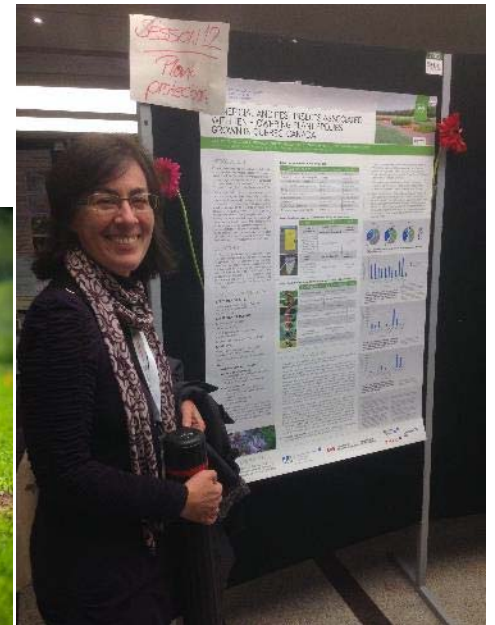
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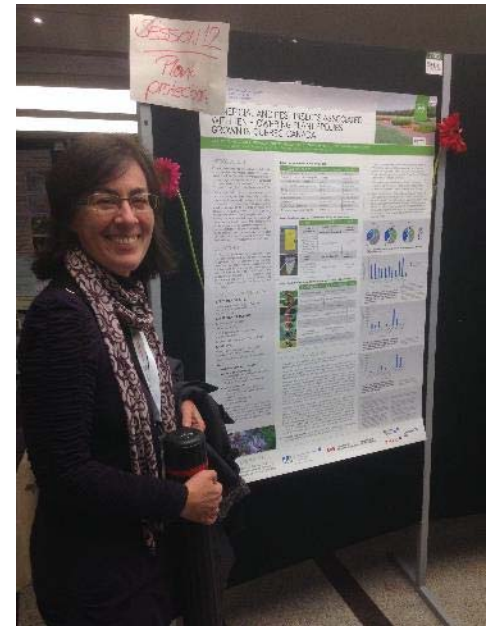
Scientific Capacity in Organic Agriculture

- University level training for students studying organic agriculture and food systems
- Creating opportunities for peers to interact builds
 - Credibility
 - Enthusiasm and peer support
 - New ideas
 - Collaboration
 - Student interest



Roadmap to Sustainability: Research

- Knowledge transfer to all
 - Organic and conventional producers
 - Consumers, policy makers
- More research in developing nations
- Region-specific research
- Recognize & integrate traditional knowledge of farmers



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