

Research

SUMMARY OF OCPA RESEARCH PROJECTS IN 2004

Descriptions of research projects sponsored by OCPA in 2004 are provided below for the areas of genetic improvement, pest management, value-added markets, tillage, nitrogen and weed management projects.

by Brenda Miller-Sanford, Business Operations Manager and Ryan Brown, Production Issues Manager, OCPA

Tillage and Cropping Systems

Effect of Tillage System Continuity on Crop Yield and Soil Parameters

W. Deen/K. Janovicek, U. of G., Guelph,
D. Lapar, AAFC, Ottawa, B. Curnoe, U. of G., Kemptville
OCPA Contribution - \$25,000
9-year project (1996-2005)
(also supported by AAFC-MII).

- The effects of intermittent tillage on yield and soil quality within an otherwise no-till system are being evaluated. Recommendations are being developed for yield expectations on reduced tillage systems relative to the length of time in no-till and conventional tillage.

Nitrogen Utilization Efficiency

Comparison of a Nitrogen Credit System to the Pre-Sidedress Nitrate Test and an Evaluation of Manure Application in a Fall Zone Till System

B. Been, U. of G., Guelph
OCPA Contribution - \$3,660
3-year project (2002-2004)

- This research will evaluate the fate of nitrogen in fall-applied manure under a range of management systems. The objective is to develop a list of "Best Management Practices" which will minimize nitrogen losses from fall-applied manure while maintaining agronomic benefit to the corn crop.

Weed Management/Sprayer Technology

Long-term Effects of Herbicide Reduction/Optimization Strategies in Field Crop Rotations

A. Hamill, AAFC, Harrow
OCPA Contribution - \$13,000
3-year project (2002-2004)

- Assessing the sustainability of various herbicide reduction strategies is being looked at as well as evaluation of the Herbicide Application Decision Support System. This project is reviewing the feasibility of using spring seed bank sampling technique to predict weed populations and improve weed control cost-effectiveness.

Control of New/Exotic Weeds in Field Corn

P. Sikkema, U. of G., Guelph
OCPA Contribution - \$15,000

This has been an on-going project since 1998

- This research looks at providing growers with effective weed control strategies for the control of a number of problem weeds that occur in Ontario.

Evaluation of Air-Induction Nozzles for Post-Emergence Weed Control

P. Sikkema, U. of G., Guelph
OCPA Contribution - \$8,000

3-year project (2002-2004)

- This project will test the effectiveness of common broadleaf and grass herbicides under field conditions using standard Teejet flat fan, Teejet and Air induction nozzles. This information will be available to growers, agri-business professionals, industry personnel and other researchers through annual Weed Science Research, presentations at grower meetings and the internet at www.ridgetownc.on.ca/weeds.

An Agronomic and Economic Assessment of Atrazine and Alternative Herbicide Strategies for Weed Control in Ontario Corn Production

C. Swanton, U. of G., Guelph
OCPA Contribution - \$5,850

3-year project (2002-2004)

- This study evaluates the agronomic

and economic benefit of atrazine when applied with selected important herbicides registered and in development for use in corn.

Corn Pest Research in Eastern Ontario

W. Asbill
OCPA Contribution - \$12,300

3-year project (2003-2005)

- Trials are set up to assess new pesticide products, tank mixes, use rates and application timings for both effectiveness and crop tolerance. It will also identify and evaluate control of emerging weed

problems in Eastern Ontario.

Impact of Reduced Herbicide Rates on Weed Control and Yield of Corn

P. Sikkema, U. of G., Guelph
OCA Contribution - \$13,750

3-year project (2003-2005)

- The effect of reduced herbicide applications is being examined on crop yield and provides information regarding situations which are likely to respond well to reduced herbicide use and conversely those situations which are unlikely to respond well. Information about herbicide programs will also be identified.

Biology, Competitiveness and Control of Tall Waterhemp in Corn and Soybeans

P. Sikkema, U. of G., Guelph
OCA Contribution - \$6,500

3-year project (2003-2005)

- This research will determine germination pattern, seed production and competitiveness of this weed in corn and soybeans in Ontario. Also, herbicide efficacy trials will be established to determine which herbicides are most effective for the control of this weed.

Prevention of Herbicide Resistance

E. Tardif, U. of G., Guelph OCA Contribution - \$18,500

2-year project (2003-2004)

- Three-way herbicide mixtures will be identified that will provide additive or synergistic action when applied at/or below normal use rates.

Biotechnology

Fusarium Resistance and Genetic Improvement in Ontario Corn Through Biotechnology

P. Pauls, U. of G., Guelph
OCA Contribution - \$62,060

7-year project (1997-2004)

(Also supported by industry and NSERC)

- Identify new, and continue development of current genes and gene-control technologies, through genetic engineering that convey Pink Ear Mold resistance and reduced mycotoxin contamination in grain corn.

Late-Season Cold Tolerance in Corn

M. Tollenaar, U. of G., Guelph
OCA Contribution - \$60,000

6-year project (1998-2004)

(Also supported by industry and NSERC)

- Reliable techniques will be developed to assess the tolerance of corn hybrids/inbreds to chilling during grain filling and determine if chilling tolerance during grain filling is correlated to early season cold tolerance. It will also investigate genetic engineering opportunities to enhance plant defense mechanisms, modify chloroplast membrane composition, and/or modify carbohydrate levels under low temperature conditions, to improve resistance of corn to low temperatures during grain filling.

Lorama Chemicals

OCPA Contribution - \$20,000

5-year project (2004-2009)

- This Project will provide the research resources to advance the commercial development of innovative, bio-resin, corn-based products derived from specialty corn types for industrial, global, market segments. This project is for research on two innovative products: polysaccharide resin for low volatile organic compound (VOC) paints, and a pet food glaze. Exploratory experimental work will be done followed by product development & testing, stability testing in potential industrial applications with customer input, interim feasibility reporting, development of commercial production scale process for manufacturing the products, development of technical specifications, and a final commercial launch.

Corn Breeding

Development of Fusarium and Multiple Pest Resistance in Ontario Corn

L. Reid, AAFC, Ottawa

OCPA Contribution - \$48,000

8-year project (1997-2005)

- Improved grain quality for both feed and food products, primarily through reduced contamination of mycotoxins and damage from insects/diseases, is being researched through the selection and breeding of corn. Resistance to fusarium ear rot, stalk rot, eyespot, leaf blight, rust, European corn borer and corn rootroom are being researched.

Guelph Corn Breeder Program

OCPA Contribution - \$15,000

- OCPA cost-shares a corn breeder faculty position at the University of Guelph. This position is important for the research and development of new, innovative breeding methods including biotechnology procedures for potential use by commercial corn breeders. This position also works with graduate and undergraduate students in corn breeding and genetics.

Ear Moulds/Mycotoxins and Corn Pest Management

Integrated Management of Emerging Field Crop Pests

A. Shaafsma, U. of G., Ridgetown

OCPA Contribution - \$20,000

3-year project (2002-2004)

- Management strategies are being developed to meet the challenges created by emerging pests in

Ontario field crops, while maintaining or reducing current levels of insecticide use in Ontario.

Drying/Storage and Food Grade Quality

Producing High Quality Food Grade Corn in Ontario

E. Lee, U. of G., Guelph, A. Schaafsma,
U. of G., Ridgetown
OCA Contribution - \$50,000

3-year project (2002-2004)

- White and yellow food grade corn is being bred and evaluated for yield, grain quality and adapted maturity for southwestern Ontario. Pest and environmental factors and identifying mitigating agronomic practices to minimize kernel red streak is being researched.

New Corn Products

Homogeneous Ionic Hydrogenation Catalysts for the Conversion of Carbohydrate Biomass to Biochemicals

M. Schlaf, U. of G., Guelph
OCA Contribution - \$50,000

3-year project (2002-2004)

- This project will discover and develop a new environmentally friendly chemical technology based on man-made catalysts, to convert agricultural products such as corn sugar or corn stalks into valuable synthetic building blocks, i.e., polymers which can be used in the manufacturing of fabrics, garments, carpets or car seat-belts.

Miscellaneous

(OCA is supportive of research initiatives that extend beyond research projects)

Hybrid Performance Trials

Annual Support

- 2004 will mark the 68th year for the corn performance trials. In 2003, 410 different hybrids were tested and the results are distributed through the Ontario Corn Producer magazine and posted on the GoCorn.net website.

Ontario Agri-Food Technologies
(OAF)

Annual Membership

- OCA is member of OAF. Biotechnology research is important to the corn industry for the development of new products which may create new markets and potentially new buyers.

Farm Input Price Monitoring

Annual Contribution

- A Ridgetown College initiative.

Corn Extension Specialist

Annual Support

- OCPA supports Greg Stewart's role as Corn Extension Specialist with OMAE. Greg provides information and suggestions on production practices through the Ontario Corn Producer magazine, GoCorn.net website and local producer meetings. "