Nova Scotia Berry Industry and Research Priorities 2018 – 2019

As compiled by
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Perennia, in conjunction with Horticulture Nova Scotia, regularly administers a variety of research projects to assist farmers in exploring new varieties of crops, improving on existing crops, determining best management practices, and managing crop pests. Approximately every two years, berry and vegetable research priority selection sessions bring together berry and vegetable growers to determine what these projects should encompass. An online survey was administered to the berry growers in November 2017 to determine research and industry priorities for strawberries, brambles, and highbush blueberries. A follow up in-person meeting was held in December 2017 to generate greater discussion around industry and research needs.

In many cases, some of the selected priorities have been extensively researched. The fact that the industry still selects these as a priority could indicate several important points:

1. The research that has been conducted is not being communicated well to growers
2. The research that has been conducted is impractical in an applied setting
3. There is a need for greater depth and/or breadth of research of the selected priority

A summary is presented below of the findings as determined by this survey and through discussion with growers and industry stakeholders.

Methodology

Survey questions were formatted to determine specific crop needs and to address issues that pertain to each crop or crop group. Numerous industry and research priorities were identified by berry growers in Nova Scotia through the survey (9 grower participants), with further priorities coming to light in the subsequent discussion (20 grower participants). Higher priorities are listed towards the top of the list.

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Strawberries

The Nova Scotia fruiting strawberry industry consists of approximately 80 commercial growers producing around 4.5 million quarts on 650 fruiting acres. An equally as important strawberry nursery industry also exists in Nova Scotia, producing bareroot and plug plants for Northern and Southern markets. The survey was directed at strawberry fruit production but many of the research priorities span strawberry nursery production as well. The following are the top industry and priorities for strawberries in Nova Scotia.

Strawberries: General Agronomy

- Plant and soil nutrition
    - Fertigation
    - Use of compost application
    - Evaluation of various compost sources
    - Fumigation + compost to restore microbial populations (post fumigation)
    - Soil quality
- New Technologies
- New cultivar development and evaluation
    - Bridge gap in July to allow for continuous production throughout season (keep labour force busy)
    - Pickability
    - Look to old varieties, eg. Blomidon variety (succumbed to June yellows) but positive attributes include size, color and firmness
    - Shelf life
    - Powdery mildew resistance
- Organophosphate, fumigant, etc. replacements (mass product phase outs)
- Resistance management

Strawberries: New Production Systems

- Low tunnel systems; high tunnel systems and greenhouse strawberries (table top soil-less system)
    - Planting timing
    - Planting density
    - Variety evaluation
    - Pest ecology
    - Nursery stock (plugs versus bareroot)
    - Dipped or not dipped pre-plant
    - Resistance management
    - Alternative pest management (e.g. beneficial insects)
- Low-tunnels
    - Aisle management/ suitable cover crops
    - Measure cost of putting tunnel up and down (better timing?)
    - Reduce frequency of tunnel up and down (effect on powdery mildew)

- Improved fruit quality (how much?)
- How much season extension does it provide?
- Impact on SWD population (high temps impact male virility)

Strawberries: Insects

- Root weevils (limited pesticide control measures, need alternatives)
- Spotted wing drosophila (primarily in day neutral production systems – raised bed and tunnel)
  - Netting (exclusion)
  - Buffer zone spraying (not entire field)
  - Spray usage/patterns (spray rotation management, frequency, timing with weather)
  - Efficacy of mass trapping
  - Cull management (incinerate; freeze; bury) – volume is the issue
  - Weed management and its effect on spotted wing drosophila populations (hospitable environment)
- Aphids as a virus vector (since virus outbreak this continues to be a concern)
- Cyclamen mite (limited control products)

Strawberries: Pathology

- Black root rot (nematode complex)
  - management of nematodes and pathogen
- Powdery mildew
  - Priority in new variety development
  - Effect of planting density
  - Resistance management
  - Alternative treatments
- Angular leaf spot - efficacy of control options
- Anthracnose (day neutral production primarily)
  - resistance management
- Botrytis (grey mold) particularly in day neutral production
  - pre-plant management
  - resistance management
  - effects of planting density

Strawberries: Weeds

- Appropriate management (timing) of dormant spray herbicides
- Inter-row burndown
- Use of herbicides in plasticulture system (increased pressure on carry-over beds)
- Chickweed (mouse-eared and common)
- Generally broadleaf weeds (e.g. groundsel)
- Buttercup

- Field Pansy
- Corn spurry
- Cleavers
- Wormseed mustard

Additional strawberry priorities mentioned in no particular order:

- Frost mitigation – new ways to prevent frost injury without overhead irrigation
- Organic production
- Bio-control of diseases and pests in high-tunnel and greenhouse environments
- Water management in plasticulture
- Wildlife management (racoons, deer)

Brambles

Raspberry acreage in Nova Scotia is estimated to be about 100 acres with limited growth in recent years. The farm gate value is approximately $1 million with very good demand and prices. Despite good market and price potential, there are very few blackberries grown in the province, although one farm has found success growing thornless varieties in a high tunnel system. The following are the top industry and research priorities for brambles in Nova Scotia.

Brambles: General Agronomy

- New cultivar development
    - Raspberry
        - Similar to Nova nice taste
        - Size and shape important to improve picking efficiency
        - Eden problems - soft, shelf life short, pale/dull, easier/faster to pick, bland
        - Commercial viability for new varieties (shelf lie, market appeal)
    - Blackberries
        - Sweetness (many are too tart) and fruit size
        - Pickability
        - Thornless
        - Hardy
        - Commercial viability for new varieties (shelf lie, market appeal)
- New Technologies
    - Trellising (metal posts with groves for wires that can be adjusted throughout season as opposed to permanent wires)
    - Long cane production
    - Improved harvest efficiency
- Plant & Soil Nutrition
    - Compost use for soil & plant health
    - Fertigation
- Product development
    - Use of waste product

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Brambles: New Production Systems

- Long cane (primocane) raspberry and blackberry production
  - Tunnel or field?
  - Variety evaluation
  - Fertigation program development
  - Yield potential
  - Economic evaluation
  - Nova Scotia potential?
- High tunnel system refinement
  - Planting timing
  - Frequency of replanting
  - Replanting diseases
  - Varieties
  - Row spacing
  - Pest ecology
  - Optimum fertigation
- Trellising systems
  - Improve pickability
  - Consistent ripening
  - Tunnel versus field
- Aisle management/ suitable cover crops
- Netting use for pest control (protective covers)

Brambles: Insects

- Raspberry fruit worm
- Aphid as a virus vector (managing vector and virus)
- Spotted wing drosophila
  - Netting (exclusion)
  - Buffer zone spraying (not entire field)
  - Spray usage/patterns (spray rotation management, frequency, timing with weather)
  - Efficacy of mass trapping
  - Cull management (incinerate; freeze; bury) – volume is the issue
  - Weed management and its effect on spotted wing drosophila populations (less hospitable environment)

Brambles: Pathology

- Botrytis (fruit and cane) – replacements for product phase-out
- Crown gall & cane gall
- Fireblight
- Nematodes (particularly in replanting)

Additional bramble priorities mentioned in no particular order:

- Reduced use of herbicides (plastic mulch?)
- Organic production
- Canker

Highbush Blueberries

The Nova Scotia highbush blueberry industry consists of over 500 acres and is gaining ground every year as interest in the industry grows and markets trend towards high antioxidant foods. The majority of the plantings are located in the Annapolis Valley, producing a normal crop of approximately 2.5 million pints valued in excess of $5 million farm gate. Nearly half of the provincial acreage has been established in the last 5 years, so many of these plantings have not yet seen their full potential. The following are the top industry and research priorities for highbush blueberries in Nova Scotia.

Highbush Blueberries: General Agronomy

- Plant & Soil nutrition
    - Planting/growing on unsuitable land
    - Pre-plant/site preparation
    - Sufficient water source for irrigation
    - Potential that product residues in soil are causing issues (pre-plant soil testing)
    - Compost pre-plant as opposed to post-plant – ease of use; efficacy
    - Amendments that impact flavour, size and shelf life (spray evaluation)
    - How can the addition of various nutrient sources (eg. Ca; Fe) effect berry characteristics at harvest?
- Product development
    - Market for overripe berries (too soft for fresh)
- Variety development (limited breeding done in NS in recent history)
    - Varieties suitable for mechanical harvesting
    - Increase flavor
    - Large size desirable
    - Quality
    - Shelf life

Highbush Blueberries: New Production Systems

- Bird Control

Highbush Blueberries: Pests

- Residue management (restrictions of importing countries)
- Spotted wing drosophila
    - Need products with shorter pre-harvest interval

  - Need increased number in product applications (re-evaluations have use patterns going the opposite direction)
  - **A lot more spotted wing drosophila damage in highbush blueberry compared to other berry crops because timing of ripening coincides with insect population spike**
  - Mass trapping (how to manage dropped berries) - volume
  - Previously population peak was November, now end of September (a lot of ripe berries)
  - Minimizing favorable environments (good drainage, few weeds, good airflow)
  - Historically 5:1 outside:inside crop but now 3:1 (more flies found inside crop)
  - Prevent them from going into fields
  - Does spraying border rows encourage them to stay out of planting?
  - Pheromone trapping
  - Ripening time versus susceptibility of variety (timing of spotted wing drosophila population fluxes) – managing various varieties in a single block
- Loss of Captan - increased cost of other products; need additional alternative products
- Leaf rust – need a product with shorter pre-harvest interval or alternative management
- Cranberry fruit worm/ cherry fruit worm – concerns with Assail
- Blueberry maggot
- Leaf hopper as a vector of blueberry stunt phytoplasm – need additional rotational products
- Weeds
  - Spreading dogbane
  - Sheep Sorrel
  - Goldenrod

Additional highbush blueberry priorities mentioned in no particular order:

- Organic production
- Canker
- Wildlife management (racoons)

Other Berry Crops

There are numerous other berries being grown in Nova Scotia, including but not limited to: haskap, cranberries, grapes, currants. As their acreages continue to grow, so do the issues and potential research opportunities in these crops. A few of the priorities for these berries mentioned in the survey include:
Haskap – diseases, pests, pesticides, cane structure and nutrition
Cranberries – fruit rot

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This report was brought to you by:

Perennia:

Operational since 2001, Perennia (formerly AgraPoint) has a 37-member team including specialists with expertise in areas of horticulture, livestock, IPM, field crops, product development and commercialization, and food safety, as well as professional skills in such areas as facilitation, adult education, information technology and communication. *The mission of Perennia is to help farmers, fishermen and food processors be prosperous and profitable.* Perennia offers a wide range of production and development services to farmers, agri-businesses, co-operatives, industry associations, universities, and government. From its offices in Kentville and Truro, Nova Scotia, Perennia provides advice through workshops, field days, in-depth projects, and one-on-one consultations in person and by phone.

Horticulture Nova Scotia:

Horticulture Nova Scotia was formed in 1998 and is a not-for-profit association. Horticulture Nova Scotia works with other horticultural interest groups to further the needs and interests of the horticulture industry. Horticulture Nova Scotia aims to promote unity and cooperation within the research community and to facilitate the identification of research priorities that will benefit the horticulture industry.