

Abstracts of Technical Papers

Presented at the Canadian Society of Agronomy, 3rd Atlantic Agronomy Workshop, 2006 Jan. 17–18, held at Charlottetown, Prince Edward Island. Although these abstracts have been edited for clarity, they have not been peer reviewed.

SESSION 1. CROPPING SYSTEMS AND FERTILITY MANAGEMENT

Cool climate corn production: Challenges and opportunities. Allan Kwabiah. Agriculture and Agri-Food Canada, Atlantic Cool Climate Agriculture Research Centre, St. John's, Newfoundland, Canada.

In addition to the 33 million litre fresh market (fluid) milk quota entitled to Newfoundland dairy farmers, an annual industrial milk quota of 33 million liters is currently being phased in over a period of 15 yr starting from August 2002. Increases in milk production and high net returns are desirable outcomes of substituting costly imported feed with locally produced feed crops such as silage corn, which is known to be higher in dry matter (DM) yield, energy and nutritional quality than the traditional grass-legume forages. The cool climate corn research program has adapted the use of biodegradable plastic mulch technology to diminish the environmental constraints such as cold spring soils and short growing seasons that reduce DM yield, maturity and quality of silage corn grown in Newfoundland. The 6-yr (2000–2005) average DM yield of silage corn seeded under the plastic mulch system was 16.4 t ha⁻¹ compared with 9.6 t ha⁻¹ with no plastic mulch. Across Newfoundland, the research has demonstrated that the timely planting of short-season corn under biodegradable plastic mulch accelerates emergence, growth, maturity and DM yield of silage corn and also improves milk yield and profitability for the dairy farmer. The role of the research in unleashing the full potential of silage corn as an engine of growth in the Newfoundland dairy industry has been unprecedented.

Key words: Dairy industry, Newfoundland, plastic mulch, short growing season, silage corn

New fertilizer nitrogen recommendations for corn. B. J. Zebarth. Potato Research Centre, Agriculture and Agri-Food Canada, PO Box 20280, Fredericton, New Brunswick, Canada E3B 4Z7.

New fertilizer nitrogen recommendations for corn have been developed for Atlantic Canada. These include general recommendations used in combination with a nitrogen credit system, and nitrogen recommendations based on the pre-sidedress soil nitrate test (PSNT). The general recommendations start with a base value, which is then modified based on credits for ammonium and organic nitrogen in manure applied prior to planting or in the previous fall, a credit for a legume crop in the previous year, a credit for high soil organic matter content, and a reduction in fertilizer nitrogen rate for fields with reduced yield potential. This recommendation determines the fertilizer nitrogen recommendation for silage or grain corn, including starter fertilizer. These general fertilizer nitrogen recommendations can be improved through the use of the PSNT. The PSNT uses a soil sample taken to 30 cm depth midway between corn rows at the corn six-leaf stage. This test measures carry-over of soil nitrate from the previous growing season plus soil mineralization occurring early in the growing season. The PSNT can be used to determine how much, if any, fertilizer nitrogen is required at sidedress.

Key words: Pre-sidedress soil nitrate test, legume, manure

Can we develop a soil test for nitrogen mineralization potential? M. Sharifi^{1*}, B. J. Zebarth¹, D. L. Burton², and C. A. Grant³.

¹Agriculture and Agri-Food Canada, Potato Research Centre, PO Box 20280, Fredericton, New Brunswick, Canada E3B 4Z7; ²Department of Engineering, Nova Scotia Agricultural College, Truro, Nova Scotia, Canada B2N 5E3; ³Agriculture and Agri-Food Canada, Brandon Research Centre, Grand Valley Road, Brandon, Manitoba, Canada R7A 5Y3.

Currently, there is no soil nitrogen (N) soil test for most crops in eastern Canada. In western Canada, N fertilizer recommendations are mostly based on soil inorganic N measured in spring. Soil N mineralization is an important source of plant available N in both regions. Nitrogen mineralization is quite variable and controlled by a number of factors including crop management, soil characteristics and environmental factors. Identification of an appropriate index of soil N mineralization can therefore improve our ability to make fertilizer N recommendations for all crops. A study was initiated in 2004 with collaborators in nine Canadian provinces as well as Maine (USA). Soil samples were collected from 0–15 cm depth from a range of climatic zones, soil types, tillage systems and crop rotations. As part of this project, a long-term aerobic incubation (22 wk) was conducted to estimate soil N mineralization potential of 173 samples. These results were compared against soil N mineralization potential assessed by a series of other lab procedures including cold KCl-NH₄/NO₃, hot KCl-NH₄, NaHCO₃ 0.01 M, CaCl₂ 0.01 M, amino sugar-N test, and the direct distillation method. Preliminary results showed different responses for soils from humid and semi-arid regions. In humid region soils, total mineralizable soil N significantly correlated with CaCl₂-N, NaHCO₃ absorbance at 205 nm, hot KCl-NH₄, and cold KCl-NH₄ ($r = 0.65, 0.64, 0.56$ and 0.54 , respectively) whereas in semi-arid soils, direct distillation-N, hot KCl-NH₄, amino sugar-N and NaHCO₃ absorbance at 260 nm were more suitable compared with other methods ($r = 0.60, 0.53, 0.49$ and 0.43 , respectively). This variation among climatic regions likely reflects differences in the predominant sources of soil mineralizable N in each climate zone.

Key words: Amino Sugar-N, CaCl₂, KCl, direct distillation, mineralizable N, NaHCO₃

Assessment of grain corn soil fertility recommendations using on-farm verification. K. B. McRae¹, M. R. Binns¹, K. E. Glover², J. van Roestel³, K. M. Perrin², J. LeDue⁴, M. Price⁵, and S. A. E. Fillmore¹.

¹Agriculture and Agri-Food Canada, Kentville Research Station, Kentville, Nova Scotia, Canada B4N 1J5; ²Azar Agriculture Inc., 90 Research Drive, Truro, Nova Scotia, Canada B2N 6Z4; ³AgraPoint Inc., 10 Webster St., Kentville, Nova Scotia, Canada B4N 1H7; ⁴Quality Evaluation Services, Nova Scotia Department of Agriculture and Fisheries, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3; ⁵New Brunswick Department of Agriculture, Fisheries, and Aquaculture, Agricultural Research Station, PO Box 6000, Fredericton, New Brunswick, Canada E3B 5H1.

Current fertilizer recommendations were derived from studies on low nutrient soils, however, these recommendations are used today for the high nutrient soils found typically on working farms. The objectives of this study were: (1) To evaluate current fertility recommendations for corn production based on a provincial soil test for both economic and environmental soundness; (2) To develop a statistical model for determining corn nutrient requirements based on soil test results,

replicated over locations and years. This study evaluated corn grain and silage yield response to applied nitrogen (N), phosphorus (P) and potassium (K). The 21 fields in the study were classified according to their existing P and K levels as either high or low. Each nutrient was applied at five levels (centered on the recommended application rate) and interactions between nutrients were assessed. Using an adaptation of the central composite design, 24 fertilizer treatment combinations were applied at seeding, retaining 50% of the nitrogen for application at the four to five leaf stage.

The yield response to applied N depended on the amount of applied P and K and on the existing soil nutrient status of the field. In soils with inherent high levels of P and K, both grain and silage yield increased with applied N, when P was applied at the recommended rate. However, the increase in yield was greater when more P was added. In high P/low K fields, grain yield increased with applied N, at all levels of P application. However, for silage yield, the recommended N application was best at all levels of applied P. In low P/low K fields higher than recommended levels of P were needed to obtain a positive response to applied N for grain yield, whereas for silage yield, the recommended rates for all three nutrients were best. Thus, the applied nutrients (N, P, K) often acted synergistically or antagonistically in the growth of the corn plants. The effects of the interactions between applied nutrients and the existing soil nutrient status, on crop yield, should be considered in nutrient recommendation planning.

Key words: Corn, nutrient recommendation, fertility, model

POSTER SESSION

Flax and solin (*Linum usitatissimum* L.) cultivar performance in the Maritime provinces. S. Urbaniak^{1*}, C. D. Caldwell^{1,2}, D. MacDonald^{1,2}, V. Jeliakov¹, and R. Lada¹. ¹Department of Plant and Animal Sciences, Nova Scotia Agricultural College, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3; and ²Nova Scotia Crop Development Institute, Nova Scotia Agricultural College, PO Box 550 Truro, Nova Scotia, Canada B2N 5E3.

The production of flax and solin (low linolenic flax) holds potential to provide agronomic and economic benefit to the Maritime provinces. Small-plot field trials were established in 2004 and 2005 at Truro, NS, Harrington, PE, and Hartland, NB. A total of 10 flax and three solin cultivars were examined. Yield data are not reported for NB due to unforeseen circumstances that occurred during seeding. Yields at Prince Edward Island (PE) in 2005 ranged from 1440 to 2220 kg ha⁻¹ for flax and from 1668 to 1992 kg ha⁻¹ for solin. Some of the highest yielding varieties in PE included AC McDuff, Emerson, Hanley and CDC Bethune with average yields of 2220, 2180, 2144 and 2120 kg ha⁻¹, respectively. Yields in NS ranged from 560 to 2316 kg ha⁻¹ for flax and from 1316 to 1868 kg ha⁻¹ for solin. The highest yielding varieties in NS included NorLin, Hanley, AC Lightning and Linola 2126 with yields of 2316, 2296, 1888 and 1868 kg ha⁻¹, respectively. Plant emergence, height, and days to flowering differed significantly among flax and solin cultivars; however, there were no significant differences in days to maturity. These results support the proposal that flax and solin can be successfully produced in the Maritime provinces.

Key words: Flax (*Linum usitatissimum* L.), solin, oilseed, cultivar, yield

Productivity, quality and diversity of a pasture sward in Atlantic Canada G. Carignan¹, N. McLean¹, A. H. Fredeen¹, J. Winter¹, and R. C. Martin^{1,2}. ¹Department of Plant and Animal Sciences, Nova Scotia Agricultural College, P.O. Box 550, Truro,

Nova Scotia, Canada B2N 5E3; ²Organic Agriculture Centre of Canada, Nova Scotia Agricultural College, P.O. Box 550, Truro, Nova Scotia, Canada B2N 5E3.

The experiment was designed to examine the effects of intensive and extensive grazing on plant biodiversity, forage weight, forage quality, milk quality and milk yields. Four pasture treatments consisted of: (A) defoliated every grazing cycle, clipping and chain harrowing after every grazing cycle; (B) defoliated every grazing cycle, one clipping only after the second grazing cycle; (C) defoliated only every second grazing cycle, no clipping or harrowing; (D) no grazing until late July, after meadow nesting birds have fledged their young. Cow responses were assessed in a paired t-test, with eight replications. Sixteen Holstein cows were randomly assigned to one of two treatments: (Intensive) grazing with access to the A and B pasture treatments only; (Extensive) grazing with access to A, B and C pasture treatments and after late July, with access to the D treatment as well. It was hypothesized that cows grazed intensively would produce more milk, with similar quality, than those grazed extensively, while extensive pasture treatments C and D would exhibit more biodiversity, albeit with lower forage quality, than treatments A and B. By allowing extensive cows to have access to intensive pasture treatments as well as to extensive pasture treatments, it was expected that the trade-off would be minimized between: (1) lower forage quality and milk yields and (2) higher biodiversity. In 2004, biodiversity was more pronounced in treatment D with unique plant species, which may be due to edge effects and/or a delayed grazing date. After the effect of grazing in alternate defoliations was evident, forage weights were higher in treatment C. As expected, forage quality was lower in the extensive treatments C and D. However, the extensively grazed cows did not compromise milk quality and produced as much milk over the season, as the intensively grazed cows.

Key words: Pasture, plant, biodiversity, milk composition

Sunola variety performance in the Maritime provinces. L. Luan¹, C. D. Caldwell^{1,2}, D. MacDonald², R. Lada¹, and V. Jeliakov¹. ¹Nova Scotia Agricultural College, Department of Plant and Animal Sciences, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3; ²Nova Scotia Crop Development Institute, Nova Scotia Agricultural College, Department of Plant and Animal Sciences, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3.

Sunola (*Helianthus annuus* L.), a group of early maturing short sunflowers (EMSS), has gained popularity due to its ease of management, lodging resistance, and early maturity; however, information is lacking on adaptation of these new sunflower varieties in the Maritimes. A two-site and 2-yr field experiment was conducted in 2004 and 2005 at Truro, NS, and Charlottetown, PE, to evaluate Sunola variety performance. The results showed that five Sunola varieties tested in this experiment significantly differed in emergence, number of leaves, stand height, head size, test weight, TKW, maturity, hull percentage and oil content. Two old varieties, AC Sierra and AC Aurora, had poorer emergence, lower plant height, larger head size, shorter growing season and lower yields than Pioneer 63A21 and 62H81. Pioneer 6150 had moderate yields and earliest maturity. It was also shown that Truro had higher seed yield and oil yield than Charlottetown.

Key words: Sunola, variety, performance, seed yield, oil yield

Evaluation of crambe and high erucic acid rapeseed (HEAR) for the Maritimes. C. D. Caldwell^{1,2}, and D. MacDonald^{2, 1}. Department of Plant and Animal Sciences, Nova Scotia

Agricultural College, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3; and ²Nova Scotia Crop Development Institute, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3

Crambe (*Crambe abyssinica*) and high erucic acid rapeseed (HEAR) are two oilseed crops grown for their high levels of erucic acid, which has many uses in the oleo chemical industry. Small plot variety evaluation trials were conducted on these crops in 2004 and 2005 to determine their suitability for production in the Maritimes. The older HEAR cultivar Reston outperformed the newer Millennium 03 but neither variety produced satisfactory yields (1.2–1.6 t ha⁻¹) in either year of the test. Crambe yields in 2004 were low perhaps due to late seeding (May 28) and inappropriate site conditions. The 2005 yields were good; both Belann and Prophet exceeded 3.0 t ha⁻¹. While the HEAR had a higher % oil than the crambe (~48% vs. 40%), the crambe oil is much higher in % erucic acid (~60% for crambe vs. ~45% for HEAR). The product of higher seed yield and erucic acid content means that the total erucic acid production of the crambe plots is higher. Crambe seems well adapted to the Maritimes.

Key words: *Crambe abyssinica*, high erucic acid rapeseed, erucic acid, oil percent, oil quality

Effect of N fertilizer on water use efficiency of timothy. O. T. Bouman^{1*} and J. Winter². ¹Department of Biology, Cape Breton University, PO Box 5300, Sydney, Nova Scotia, Canada B1P 6L2; ²Nova Scotia Agricultural College, Truro, Nova Scotia, Canada B2N 5E3.

A field experiment was conducted on a wind-exposed site with a very rapidly draining soil to explore the water use efficiency (WUE) of an established pasture dominated by Timothy (*Phleum pratense* L.). Weather conditions in the month preceding the experiment were normal but dry in July (38 mm) and again normal in August (95 mm). In a fully randomized split-plot-design with four replicate blocks, main treatments consisted of control plots and nitrogen plots with a single application of ammonium nitrate at a rate of 50 kg N ha⁻¹ on June 28. The first sub-plot-treatment was clipped twice on July 28 and September 03, and the second sub-plot-treatment was clipped once on September 03 to simulate two levels of grazing frequency. Plots clipped once produced 6 kg dry matter mm⁻¹ of rain in controls compared to 11 kg in N plots. Plots clipped twice produced in July, 12 kg DM in controls and 33 kg in N plots. In August, these WUE values decreased to 4 kg and 6 kg, respectively. Residual water in the top soil was low and inversely related to hay yields. Thus, moderate summer application of mineral nitrogen greatly increases the soil water capture by timothy. The grass species would likely remain dominant and soil nutrient leaching would be reduced in pasture patches with increased levels of soil nitrogen fertility. This competitive advantage of timothy would diminish with increasing grazing frequency.

Key words: Pasture, soil fertility, grazing frequency, water use efficiency

Phosphorus management in carrot production. K. R. Sanderson and Sylvia Wyand. Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Ave., Charlottetown, Prince Edward Island, Canada C1A 4N6.

Field trials were established at six sites from 2003 to 2005 in the Brookfield area of Prince Edward Island (PE) to examine the impact of phosphorus fertilization on nutrient uptake and yield of

fresh pack carrots. Generally, local growers apply about 200 kg P₂O₅ ha⁻¹ for fresh pack carrot production. Each trial consisted of P₂O₅ applied pre-plant at 0, 75, 150, 225 and 300 kg ha⁻¹. All plots received recommended applications other macro and micro nutrients typically used for carrot production in PE. Calcium ammonium nitrate was applied as a top-dress at 50 kg N ha⁻¹ in late July. Across sites, leaf tissue P linearly decreased with increasing rate of P₂O₅ at the mid-season sampling, but was not affected at the harvest sample. Leaf tissue P concentration was within sufficient range at both sampling times; however, the harvest sample was lower. Soil P₂O₅ levels at harvest were linearly increased with increasing rate of P₂O₅ applied. All applications of P₂O₅ increased total carrot yield compared with plots where P₂O₅ was not applied. Total and marketable yield were linearly increased with increasing rate of P₂O₅. Results indicate that lower rates of phosphorus can be used without significantly impacting yield.

Key words: Carrots, phosphorus, yield, nutrient uptake

Evaluation of stem cutting treatments for the propagation of wild roses (*Rosa virginiana*, *Rosa Carolina*). S. E. Stewart-Clark^{1*} and K. Sanderson². ¹Department of Biology, University of Prince Edward Island, 550 University Ave., Charlottetown, Prince Edward Island, Canada C1A 4P3; and ²Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Ave., Charlottetown, Prince Edward Island, Canada C1A 4N6.

Rosehips are currently being investigated as a potential new crop for the agricultural industry in Prince Edward Island. An important aspect of this project includes the development of efficient stem cutting propagation methods to produce plantlets in greenhouses for field production. There are many factors that have been shown to effect rooting in rose stem cuttings once they are planted in a greenhouse setting (species, growth type, collection date, original bud position along motherstem, habitat and hormone treatments). In this study, we are comparing the effect of all of these factors on overall rooting success and mean root length of wild rose cuttings in PE. Two wild species of rose were used in this study (*R. virginiana* and *R. carolina*) along with a suspected hybrid of the two. Cuttings were collected every 3 wk from June to September from nine wild populations in PE. These cuttings were taken from apical, mid and basal portions along the mother stem and were either treated with 0.1% IBA, 0.4% IBA, 0.8% IBA or with no hormone treatment (control). IBA treatments increased both rooting success and mean root length in cuttings in this study. Collection date also impacted on rooting success, with lowest rooting numbers occurring in mid June and highest rooting numbers in early July. Cuttings from basal buds also had lower rooting success than cuttings from apical or mid buds. Site location of the mother plant also impacted on overall rooting success in cuttings.

Key words: Stem cuttings, rooting, propagation, roses, IBA

Evaluation of several new herbicides for potatoes. J. A. Ivany¹ and K. V. McCully². ¹Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Ave, Charlottetown, Prince Edward Island, Canada C1A 4N6; and ²New Brunswick Department of Agriculture, Fisheries and Aquaculture, Fredericton, New Brunswick, Canada.

There has been a reduction in the number of herbicides for weed management in potatoes due to removal from registration and development of weed resistance. Additional herbicides are needed for potatoes in Canada to broaden the spectrum of weed species

controlled and to improve control of weed species that are resistant to most commonly used herbicides. The herbicides sulfentrazone, flumioxazin, and dimethenamid-p are registered for use on potatoes in the western United States. These herbicides control weeds that are problems in potato production but injury and reduced marketable yield have been reported. We examined the response of weeds and potatoes to these herbicides in PE and NB during 2001 to 2005. Sulfentrazone applied pre-emergence caused slight, short-lived injury to potatoes and gave excellent control of lamb's-quarters (*Chenopodium album* L.) but not wild radish (*Raphanus raphanistrum* L.). Flumioxazin gave control of lamb's-quarters and wild radish. Both herbicides used at emergence or post-emergence caused severe injury on potatoes and reduced yield compared with the standard herbicides metribuzin and linuron. Dimethenamid-p applied at ground crack caused severe but short lived injury on potatoes and controlled lamb's-quarters and corn spurry (*Spergula arvensis* L.) but not wild radish. Even though dimethenamid severely injured potatoes early, there was no effect on yield in treatments where the three main species present in the plots were controlled.

Key words: Potato, *Solanum tuberosum*, dimethenamid-p, flumioxazin, sulfentrazone, weed control

Alternative pest controls for the Colorado potato beetle, *Leptinotarsa decemlineata* on potatoes. Tara Moreau*, Jeff Hoyle, and Phil Warman. Department of Environmental Sciences, Nova Scotia Agricultural College, P.O. Box 550, Truro, Nova Scotia, Canada B2N 5E3.

A challenge for organic growers is efficient, reliable pest management. The Colorado potato beetle (CPB) *Leptinotarsa decemlineata* (Say), is one of the most important defoliator pests of potatoes in Canada. This research was intended to provide organic growers with alternative, environmentally safe tactics for controlling CPB. Two methods of CPB control were examined with plants as the pest control agents (companion planting and plant-derived insecticides) during the summers of 2002 and 2003, in Colchester Co., NS. In 2002, the trial was conducted in Truro and in Onslow and in 2003, only in Truro. Potatoes, cv. Superior and cv. Fundy, were used for both years. The companion plants, flax, marigold and bush bean were germinated in growth chambers (25°C, L16:D80). The seedlings, in addition to horseradish rootlets, were later transplanted into the field. Garlic Barrier AG®, Hot Pepper Wax™, Neemix 4.5® and Novador® were sprayed once a week using a hand-held CO₂ sprayer and Vapor Gard® was added to all treatments as a surfactant. Two control plots were used, a no-CPB-action treatment and a surfactant control treatment. Results from 2003, show that neem tree extracts provide effective control against the CPB. Plots treated with Novador® did demonstrate good beetle control, however it was not as effective as Neemix 4.5®.

Key words: Colorado potato beetle control, companion planting, plant-derived insecticides

Management of plant-parasitic nematodes in agricultural crops. J. Kimpinski, C. E., Gallant, J. G. McIsaac, and R. D. Reddin. Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Ave, Charlottetown, Prince Edward Island, Canada C1A 4N6.

Plant-parasitic nematodes cause significant losses in agricultural crops. The root lesion nematode (*Pratylenchus penetrans*) and the northern root-knot nematode (*Meloidogyne hapla*) are widespread in

eastern Canada and cause serious losses in potatoes and other horticultural crops. Proper field equipment, correct sampling methods, and accurate identification of nematodes are essential in assessing risk potential and management of nematodes. Fumigants and chemicals are very effective in reducing nematode population levels, but are expensive and may cause environmental pollution. Molecular technologies for developing nematode-resistant cultivars are an area of research that holds promise in the future. Plants such as marigolds that are poor hosts or antagonistic to nematodes have been investigated in the Maritime region and this has resulted in fewer nematodes when the subsequent cash crop is planted. Japanese millet, mustard, and phacelia are also being investigated for their ability to suppress nematode populations. To date, marigolds have given the best consistent yield increases in the subsequent potato crop. Based on 7 yr of data in experimental plots, tuber yields of the cultivar Superior planted after marigolds have been 19% and 12% greater; respectively, than after red clover or soybeans.

Key words: Marigolds, nematodes, potatoes, rotation crops

Mefenoxam sensitivity of Canadian strains of *Phytophthora erythroseptica*, causal agent of potato pink rot, and the impact of *P. infestans*-infected tubers on the chemical control of rot in storage. P. D. Young¹, R. D. Peters^{2*}, H. W. (Bud) Platt², and L. R. Hale¹. ¹Department of Biology, University of Prince Edward Island, 550 University Ave., Charlottetown, Prince Edward Island, Canada C1A 4P3; ²Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Ave., Charlottetown, Prince Edward Island, Canada C1A 4N6.

Mefenoxam is the only chemical currently registered in Canada for controlling *Phytophthora erythroseptica*, the causal agent of pink rot of potato. Recently, mefenoxam-resistant strains of *P. erythroseptica* have been isolated in Idaho and Maine, which has cast doubt on the continuing usefulness of this fungicide. The impact of the presence of *P. infestans*, the causal agent of late blight of potato, on the efficacy of mefenoxam is also of interest due to the common occurrence of both late blight and pink rot in storage. To test for the development of pathogen resistance to mefenoxam in Canada, a nation-wide survey was conducted. The pathogen was isolated from tubers displaying symptoms of pink rot and tested for sensitivity to mefenoxam at various concentrations using an in vitro V8 agar assay. The impact of *P. infestans* on the efficacy of mefenoxam was tested with both in vitro and in vivo experiments. The in vivo experiment involved inoculating mefenoxam-treated tubers with *P. infestans*, and then re-inoculating them with *P. erythroseptica* after various time intervals, after which pink rot development was assessed. The in vitro experiment involved inoculating mefenoxam-amended (or unamended) V8 broth with *P. infestans* and filtering out the pathogen mycelium after a specific time period. The broth was then re-inoculated with *P. erythroseptica* and the mass of the mycelium was recorded after a second time interval. The results of these experiments are part of the continuing evaluation of the effectiveness of mefenoxam for the chemical control of pink rot in Canada.

Key words: Mefenoxam, pink rot, *Phytophthora erythroseptica*, late blight, *Phytophthora infestans*, potato

SESSION 2: SOIL AND WATER QUALITY

Crop nutrient activities on Prince Edward Island. S. Mellish* and B. Thompson. Prince Edward Island Department of Agriculture, Fisheries, and Aquaculture, PO Box 1600, Charlottetown, Prince Edward Island, Canada C1A 7N3.

Prince Edward Island is the only Canadian province to rely 100% on ground water sources. To protect water quality while maintaining optimum crop yield and quality, farms need to adopt beneficial management practices (BMP) such as nutrient management. Crop response to nutrients, movement of nutrients through soil and water, and other technical information and support is required to increase adoption. The Prince Edward Island Department of Agriculture, Fisheries, & Aquaculture (PEIDAF) has worked both independently and cooperatively with industry and ENGOs on demonstration and research projects. Highlights and initial results will be presented.

Key words: Best management practices, nutrient management, water quality, potatoes

Persistence and movement of *E. coli* in agricultural soils in the Annapolis Valley. Keith D. Fuller¹, Robert J. Gordon², Glenn W. Stratton², Ali Madani², Mark Grimmett³, and Jack Van Roestel⁴. ¹Agriculture and Agri-Food Canada, 32 Main Road, Kentville, Nova Scotia, Canada B4N 1J5; ²Nova Scotia Agricultural College, 20 Tower Road, Truro, Nova Scotia, Canada B2N 5E3; ³Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Ave., Charlottetown, Prince Edward Island, Canada C1A 4N6; ⁴AgraPoint, 210-10 Webster St., Kentville, Nova Scotia, Canada B4N 1H7.

The occurrence of water-borne pathogens from agricultural sources such as *E. coli* in surface and ground water bodies is an important public and private water quality issue. The disturbance of natural, macropore networks by tillage practices in agricultural soils has the potential to affect the movement of fecal coliforms in soil and their appearance in tile water discharge. The appearance of *E. coli* in tile drainage waters in response to the application of liquid dairy manure (LDM) on zero, minimum and conventional till plots in a corn-soybean-wheat rotation was monitored. Concentrations of *E. coli* in excess of 650 CFU 100 mL⁻¹ were detected when an application of LDM preceded a 35-mm storm rainfall event and high tile flow rates. A further application of LDM 24 mo later did not result in any increase in counts due to the absence of significant weather events and absence of spikes in tile flow subsequent to the application. Zero till treatments resulted in higher *E. coli* counts during the fall of 2002, but this was not a consistent observation during other tile flow periods. Higher discharge rates were also conducive to the appearance of this pathogen in tile waters. Outside of peak tile flow periods, counts remained well below recreational water standards, supporting the hypothesis that the appearance of fecal coliforms in tile discharge from manured, agricultural land is event-driven.

Key words: *E. coli*; tile drainage; tillage practices; liquid dairy manure

Phosphorus reduction in poultry and dairy manures using mineral amendments. J. D. Wilson^{1*}, V. D. Zheljzkov^{1,3}, B. Rathgeber¹, D. Burton², and C. D. Caldwell¹. ¹Department of Plant and Animal Sciences, and ²Department of Environmental Sciences, Nova Scotia Agricultural College, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3; ³Mississippi State University, North MS Research and Ext. Center, Verona, MS, 38879, USA.

Incubation, greenhouse, and field experiments were conducted to assess the effect of six mineral soil amendments (alum, calcitic lime, dolomitic lime, ferric chloride, gypsum, and slacked lime) on availability of P from animal manures. In the incubation study, four application rates of the six amendments (0, 50, 100, 200 g amendment kg⁻¹ of manure) were tested for three manures (liquid

dairy, laying hen, and broiler hen). Ferric chloride (200 g kg⁻¹ manure) and alum (200 g kg⁻¹ manure) reduced Mehlich-3 extractable P by 93% and 86%, respectively, relative to the unamended control. In the greenhouse container experiment, the manure incubated with ferric chloride, alum, and slacked lime at 100 and 200 g kg⁻¹ was used as a fertilizer for growing timothy (*Phleum pratense* L.). The low ferric chloride and high slacked lime treatments decreased timothy biomass yields compared with an N-P-K fertilized control. In the field experiment, perennial timothy stand was amended with alum at 50 g alum kg⁻¹ soil. Preliminary data indicate no negative effect of alum-amended manure on field grown timothy. Overall, our results indicate that pretreatment of animal manure with mineral amendments may reduce Mehlich-3 extractable P in soil without negative effect on timothy yields.

Key words: Manure amendment, phosphorus reduction, Mehlich-3 phosphorus, timothy

Interactions between climate change, feed quality and greenhouse gases from dairy livestock. Alan Fredeen and Mike Main, Plant and Animal Sciences, Nova Scotia Agricultural College, Truro, Nova Scotia, Canada B2N 5E3

Agriculture must lower its emission of greenhouse gases (GHG) in accordance with Canada's commitment to the Kyoto Protocol. The use of diets with higher grain content in the dairy industry is an attractive strategy for lowering production of methane per kg milk, especially since it is already evolving toward greater intensification. Feeding higher grain diets to achieve higher milk yield per cow, however, may increase total GHG emission, and diminishes the natural niche of ruminant as converter of forage to human food. Climate change threatens forage quality and adds uncertainty in the prediction of agricultural GHG. To the extent future climate is drier and hotter during the growing season, GHG emission from the dairy industry will likely increase, unless the national herd size continues to decline.

Key words: Greenhouse gases, feed quality, climate change, dairy cattle

Composted, vs. fresh-applied, vs. Ca(OH)₂-stabilized mussel processing waste: Pros, cons, and their effects on radish and oat forage. Thomas L. Gallant¹, John A. MacLeod², Robert Gordon³, John Blanchard³, and Mark Grimmett². ¹Department of Biomedical Sciences, Atlantic Veterinary College, University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada C1A 4P3; ²Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, Charlottetown, Prince Edward Island, Canada C1A 4N6; ³Nova Scotia Agricultural College, Department of Engineering, Box 550, Truro, Nova Scotia, Canada B2N 5E3.

Because the Blue Mussel (*Mytilus edulis*) aquaculture industry generates a large quantity of waste through the grading process (MPW) there is interest in developing an agricultural use for this material. Direct application of MPW to land can recycle nutrients efficiently, but limitations to its widespread use include production of offensive odours during spreading, potential acidification of soil due to the process of decomposition, and possible aquifer pollution through nitrate leaching. Composting with a C source can stabilize MPW and minimize odours, but leaching of nitrate and orthophosphate and slow mineralization of organic N limit its usefulness as a crop nutrient source. Combining MPW with small amounts of hydrated lime [Ca(OH)₂] can be a better alternative for stabilization because the process is rapid, does not require a C source, and

results in more crop-available N. Composted, fresh-applied, and Ca(OH)₂-stabilized MPW were recently compared in terms of elemental composition and crop performance/nutrient uptake of radish and oat. Fresh and Ca(OH)₂-stabilized contained substantial macro/micro nutrients; composted had less plant-available N. MPW can be an effective nutrient source if crop damage can be avoided. Composted MPW does not damage crops or generate offensive odours, but has lower nutrient availability. Ca(OH)₂-stabilized MPW retains more nutrients from fresh MPW and avoids phytotoxicity and odour problems.

Key words: Hydrated lime, mussel waste, composting, seafood processing waste

The chemical characterization and crop response of crustacean shell processing waste. Mark Grimmett and John MacLeod. Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Ave, Charlottetown, Prince Edward Island, Canada C1A 4N6.

A study was undertaken to examine the potential use of crustacean shells (lobster and crab) from local seafood processing plants as a soil amendment for agricultural purposes. Composted or fresh waste was applied to barley and spelt plots in an organic system. Samples were analyzed for N, P, K, Ca, Mg, and S. Cereal yields were highest with spring applied fresh waste and generally increased with spring applied composted wastes. Yield responses to fall applications were smaller and less consistent. Nitrogen and sulfur grain concentrations were highest with fresh waste applied in the spring. Phosphorus and potassium concentrations of barley were generally higher for composted waste when compared with the fresh or control treatments. Grain calcium concentrations generally increased with spring applications of composted and fresh waste. Higher concentrations of grain N, Ca, and S from the fresh waste were related to higher concentrations in the waste. Higher concentrations of P in the grain could not be explained by P content of the wastes. Higher concentrations of K in the grain were related to the higher concentration of K in the compost. Crustacean processing wastes contain nutrients that can be effectively used in crop production.

Key words: Seafood waste, compost, agriculture, barley, spelt

Evaluation of Pb and Cu bioavailability from compost-amended soils A. Cooper¹, V. D. Zheljzkov^{1,2}, B. Rathgeber¹, and D. Lynch. ¹Department of Plant and Animal Sciences, Nova Scotia Agricultural College, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3; ²Mississippi State University, North MS Research and Ext. Center, Verona, MS, 38879, USA.

Land treatment of organic wastes is a technology that has economical advantages for application where there is a desire to retain and enhance agricultural systems for sustainable production, while conserving water through waste reuse and protecting ground water and surface water natural resources. It would be greatly beneficial to the environment, urban populations, and agricultural producers if municipal, industrial, commercial, or institutional waste compost found a safe and well-defined role in the ecosystem. The long-term goal of this project is to enhance the understanding of the bioavailability, mobility, and long-term effects of compost-born copper (Cu) and lead (Pb) in agricultural soils on crop uptake and the impact on poultry. A study following several years application of sewage sludge and municipal solid waste compost in a no-till field production system may determine the effect of industrial composts

on soil quality through monitoring nutrient levels, the bioavailability and speciation of Cu and Pb in a no-till corn production system under varying soil pH levels. In addition, separate experiments with poultry feeding studies will assess the bioavailability of Cu and Pb of compost-amended soil when included in the diet of commercial broilers. The redistribution and changes in speciation of Cu and Pb may be affected by the type of compost, the rate of application, and the type of cropping systems utilized. The project may serve to cultivate the development of viable techniques for predicting crop and livestock uptake of Cu and Pb following the application of industrial compost to agricultural land. Results may be used for fine-tuning of the Canadian guidelines for compost quality. The project will contribute to our understanding of the mobility of compost-born Cu and Pb in soil/plant/livestock system.

Key words: Bioavailability, compost, copper, corn crop yield, lead, municipal solid waste, sewage sludge

SESSION 3: FIELD CROPS

Organic feed grains research in Atlantic Canada A. Hammermeister^{1*}, D. H. Lynch¹, H. Nass², and R. C. Martin¹. ¹Organic Agriculture Centre of Canada, Department of Plant and Animal Sciences, Nova Scotia Agricultural College, P.O. Box 550, Truro Nova Scotia, Canada B2N 5E3; ²Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Avenue, Charlottetown, Prince Edward Island, Canada C1A 4N6 (Deceased).

Organic farmers in the Maritimes are seeking cost-effective and high protein crops, including peas intercropped with cereals, lupins and flax. In multi-site-year trials, barley and oat monocrops yielded 2–3 t ha⁻¹, compared with 3–4 t ha⁻¹ for peas intercropped or alone. Protein contents were <12% for cereal monocrops, 15–20% for pea intercrops, and 23% for peas alone. In on-farm trials, the mean yield of oat-pea intercrops increased by 0.15 t ha⁻¹ and protein content increased by 2%, compared with oat monocrops. Yield of imported lupins ranged from 0.4 to 4.1 t ha⁻¹ with >40% protein in some varieties. Protein yield was 1.5 t ha⁻¹ for white lupins and <0.6 t ha⁻¹ for yellow and blue lupins. Disease, heat stress and wireworm limited some varieties. Flax has many feed benefits and >20% protein. Yields in 2005 trials were 0.1–1.3 t ha⁻¹, with reductions due to soil conditions, drought, and tine weeding losses.

Key words: Feed grains, organic farming, lupins, field peas, flax

Low-input technique to reintroduce red clover into naturalized pasture stands is a slow process. Matthew D. Crouse¹, Y. A. Papadopoulos², K. B. McRae³, A. H. Fredeen¹, and A. S. Fillmore³. ¹Nova Scotia Agricultural College, Department of Plant and Animal Science. P.O. Box 550, Truro, Nova Scotia, Canada B2N 5E3; ²Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Ave., Charlottetown, Prince Edward Island, Canada C1A 4N6; ³Agriculture and Agri-Food Canada, Atlantic Food and Horticulture Research Centre, 32 Main Street, Kentville, Nova Scotia, Canada B4N 1J5.

Pastures in the Maritimes often contain native species of forage such as bluegrasses (18–82%), couchgrass (7–49%), timothy (4–18%), bentgrass ((1–5%), and various legumes (1–5%). The species composition of these pastures probably reflects an equilibrium under the conditions of current grazing intensity. In swards that are dominated by cool-season grasses, animal productivity could be improved by renovating the pasture to include legumes.

This research initiative was designed to evaluate the effectiveness of introducing red clover into permanent pasture without using herbicide to reduce competition from other pasture plants during the establishment of red clover. The trial was conducted over a 3-yr period (2000–2002) at three pastures, receiving only dung from grazers as the managed nutrient source. At each site, the red clover was sod-seeded early in the summer and botanical samples were obtained from each site prior to seeding to determine the species composition of the permanent sward. Red clover populations were monitored throughout the trial. The results of this study showed that prior to seeding red clover represented less than 5% of the sward. On average, the number of red clover plants increased in response to sod-seeding. Although reintroducing red clover plants into old forage stand is a slow process, their contribution to the total sward biomass was increased over the 3 yr of this study by sod seeding the clover each year. Under reduced input and/or organic management systems of sheep production, renovating old pasture stands by introducing red clover is a slow process; the contribution from red clover plants gradually increases over successive seasons with greater increases in some fields than others.

Key words: Sheep, red clover, pasture, sod-seeding, renovating

Biofuels – The potential of field crops. P. Boswall, Prince Edward Island Department of Agriculture, Fisheries, and Aquaculture, P.O. Box 1600, Charlottetown, Prince Edward Island, Canada C1A 7N3.

Low commodity prices, international agreements to limit greenhouse gas emissions, volatile energy markets and technology development are creating opportunities for the development of biofuels from field crop production. These opportunities will require a change both in marketing approach and post-harvest investment if there is to be an impact on producer economic sustainability. The potential to use cereal grains as a combustion fuel to replace number two fuel oil on a 2.5:1 ratio will be highlighted. As well, the use of crop processing by-products as a source of renewable energy will be discussed.

Key words: Biofuel, renewable energy, crops

Late-maturing hay, forage quality, and grassland birds: Conservation you can chew on! S. LeMoine^{1*}, S. Bondrup-nielsen¹, K. MacKenzie², and G. Parsons³. ¹Biology Department, Acadia University, 24 University Ave., Wolfville, Nova Scotia, Canada B4P 2R6, ²Agriculture and Agri-Food Canada, Atlantic Food and Horticulture Research Centre, 32 Main St., Kentville, Nova Scotia, Canada B4N 1J5, ³Wildlife Division, Nova Scotia Department of Natural Resources, 136 Exhibition St., Kentville, Nova Scotia, Canada B4N 4E5

In 2005, a field experiment was initiated studying the effectiveness of a late-maturing hay cultivar in providing adequate forage for beef cattle under a delayed cutting regime. Three hayfields were planted with the late cultivar Comtal[®] timothy and winter seeded with Altaswede[®] red clover. A delayed cut date of July 07 was chosen as grassland birds fledge the majority of their young by the first week of July. Forage samples were collected weekly from the late cultivar hayfields and adjacent conventional hayfields of comparable size from June 15 to July 19. Percent crude protein (CP) levels from the late-maturing hayfields were suitable for calves and pregnant females (>11%) up to and beyond the first week of July, while acid detergent fibre (ADF) levels were found to be higher than recommended levels for both the late cultivar and conven-

tional hayfields. Calcium (Ca) levels in the late-maturing cultivar were sufficient except for growing calves but phosphorus (P) levels were lower than recommended, although a sufficient Ca:P ratio was observed for the three July samples. The findings support the concept that a late-maturing hay cultivar, with some minor phosphorus supplementation, provides adequate forage for beef cattle, while improving habitat for grassland birds.

Key words: Late maturing cultivar, crude protein, delayed cut, grassland birds, peak fledging period

SESSION 4: PEST MANAGEMENT – DISEASES, INSECTS AND WEEDS

Increasing seeding rate in organic production: Effects on weed competition, crop yield and quality. R. Beavers^{1*}, A. Hammermeister¹, R. C. Martin¹, B. Frick², and D. H. Lynch¹. Organic Agriculture Centre of Canada, ¹Department of Plant and Animal Sciences, Nova Scotia Agricultural College, P.O. Box 550, Truro Nova Scotia, Canada B2N 5E3; and ² Department of Plant Sciences, University of Saskatchewan, 51 Campus Dr., Saskatoon, Saskatchewan, Canada S7N 5A8.

Many organic producers seed spring wheat (*Triticum aestivum* L.) at higher rates than conventionally recommended. By increasing seeding rate, the crop is expected to become a stronger competitor against weeds. A 2-yr study assessed the response of spring wheat to variable seeding rates (1× conventional, 1.25×, 1.5× and 2×) in a plot experiment in Nova Scotia and on organic farms across Canada. Weed biomass and weed nitrogen uptake were reduced at higher wheat seeding rates. Weed suppression corresponded with an increase in light interception at higher seeding rates midseason, as well as increased crop height and biomass and accelerated maturity. Highest yield was obtained at double the conventional seeding rate in 2003 and at the 1.25×, 1.5× and 2× seeding rates in 2004, although crop density differences among these rates were small due to poor emergence in 2003. On organic farms, a 1.25× seeding rate was sufficient to maximize yield.

Key words: Spring wheat, seeding rate, organic farming, weed competition

Response of smooth bedstraw (*Galium mollugo*) to several herbicides. J. A. Ivany and V. Rodd. Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Ave, Charlottetown, Prince Edward Island, Canada C1A 4N6 and Nappan Research Farm, Nappan, Nova Scotia, Canada.

The perennial weed smooth bedstraw (*Galium mollugo* L.) has become a serious weed in long-term pastures in the Atlantic region. It is commonly seen along roadsides from where it spreads into fields and once established forms a patch and takes over the pasture. Horses and cattle avoid it and if consumed it affects weight gain and in dairy cattle milk production. Few herbicides will give control in the growing pasture so growers must kill down the pasture, till the soil, and reseed; however, the large seed bank in soil soon results in re-infestation. Additionally, growers do not want to lose pasture for several months so we need effective herbicides to use in early summer to give control. We evaluated in 2002–2003 the herbicides MCPA, mecoprop and dicamba alone and in mixtures and in 2004–2005 clopyralid and triclopyr at Nappan, NS, for potential to control smooth bedstraw for the growing season and level of control into the next year. In 2002–2003, mecoprop at 2.0 kg a.i. ha⁻¹ and dicamba + mecoprop at 1.0 + 0.75 kg a.i. ha⁻¹ gave control of smooth bedstraw for the growing season but not in the

second year. Other herbicides and mixtures did not give effective control. In 2004–2005, the single application of mecoprop and the mixture of mecoprop + dicamba gave good control of smooth bedstraw, but control was less in September indicating loss of control over the summer. Clopyralid did not give control of smooth bedstraw. Triclopyr at the high rate of 1.92 kg a.i. ha⁻¹ gave control of smooth bedstraw. The two lower rates of 0.48 and 0.96 kg a.i. ha⁻¹ gave good initial control, but control was reduced over the summer. The two highest rates of triclopyr gave highest grass yields. Triclopyr provided 90% or greater control into the second year.

Key words: Smooth bedstraw, *Galium mollugo*, mecoprop, dicamba, clopyralid, triclopyr, weed control

Impact of canopy trimming on carrot yield and the incidence of sclerotinia rot. R. D. Peters* and K. R. Sanderson. Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Ave., Charlottetown, Prince Edward Island, Canada C1A 4N6.

Field trials were established at sites in Brookfield and Oyster Bed, Prince Edward Island, in 2005 to examine the effects of canopy trimming on carrot yield and the incidence of sclerotinia rot (*Sclerotinia sclerotiorum*). Each trial was identical and, in addition to control plots that were not mowed, included mowing treatments at three different times (row closure and 1 wk pre- and post-row closure) and two levels of intensity (20 and 40% of canopy removed). The incidence of sclerotinia rot on petioles was assessed in August and September. Carrot yield was assessed following harvest and the incidence of sclerotinia rot was determined after a storage period. Trimming the carrot canopy had no negative effect on the total or marketable weight of carrots at either site. The incidence of sclerotinia rot was very low in Brookfield, and treatment differences could not be ascertained. At the Oyster Bed site, canopy trimming significantly ($P = 0.05$) reduced the incidence of petioles with sclerotinia rot compared with the control. Similarly, the incidence of diseased carrots in storage was reduced by some mowing treatments. Mowing intensity, not timing, appeared to be the main factor in reducing disease pressure. Canopy trimming should be evaluated further as an environment-friendly method for controlling sclerotinia rot in carrots.

Key words: Carrot, yield, sclerotinia rot, *Sclerotinia sclerotiorum*

SESSION 5: NEW FIELD CROPS AND CROP UPDATE

The influence of cultivar and management on the performance of *Camelina sativa* in the Maritime provinces. S. Urbaniak*, C. D. Caldwell^{1,2}, D. MacDonald^{1,2}, V. Jeliakov¹, and R. Lada¹. ¹Department of Plant and Animal Sciences, Nova Scotia Agricultural College, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3; and ²Nova Scotia Crop Development Institute, Nova Scotia Agricultural College, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3

Camelina sativa (CS), a novel oilseed crop with unique oil properties and market opportunities, is currently being evaluated for its development in the Maritime Provinces. In order to determine the suitability of CS for this region, small plot field trials were established in 2004 and 2005 in Truro, NS, Harrington, PE, and Hartland, NB. The cultivar Calena performed best overall in the cultivar trials. The effect of seeding rate, seeding date and seeder type on the establishment and success of CS was also evaluated. Seeding rates of 200, 400, 600 and 800 seeds m⁻² were tested; even

at the lowest seeding rate the yield of CS was not significantly affected, likely due to its compensatory branching ability. Yield was not significantly affected by seeding date (two dates approximately 2 wk apart) or by seeder type (forage seeder versus seed drill). Yields as high as 2750 kg ha⁻¹ were realized, with average yields ranging from 2000 to 2500 kg ha⁻¹. Oil content levels were in the range of 37 to 40%, comparable with reported literature values. Initial results indicate that high quality CS can be produced in the Maritime provinces.

Key words: *Camelina sativa*, oilseed, yield, seeding rate, seeding date, seeding method

Taming the wild rose. R. Barry^{1*}, K. Sanderson², J. Kemp¹, and S. E. Stewart-Clark¹. ¹Department of Biology, University of Prince Edward Island, 550 University Ave., Charlottetown, Prince Edward Island, Canada C1A 4P3; and ²Agriculture and Agri-Food Canada, Crops and Livestock Research Centre, 440 University Ave., Charlottetown, Prince Edward Island, Canada C1A 4N6.

Roses of the genus *Rosa* are found growing wild throughout the Atlantic provinces in a multitude of different habitats. Rose hips, the marketable product from these roses, are a rich natural source of antioxidants and fatty acids useful in the pharmaceutical industry. In 2004 a wild rose field trial was established at the Agriculture and Agri-Food Canada Harrington Research Farm on Prince Edward Island. Planting stock from this trial was propagated from wild rose populations throughout PE. Topical treatments with corresponding controls were applied in 2004 and 2005 and included: bark or straw mulch, compost or chemical fertilizer, and sod or tillage between plots. Growth measurements were taken at the beginning and end of the 2005 growing season in order to determine treatment effects on the growth and development of rose plants. Results from 2005 measurements indicate that plants growing in plots with straw mulch, chemical fertilizer and tillage between neighbouring plots had a greater overall plant spread, higher number of ramets and greater mass of rose hips produced. Outcomes from this experiment will be used to establish optimum protocols for growing these plants commercially as an agricultural crop for the Atlantic provinces.

Key words: Wild rose, rose hip, *Rosa* sp., alternative crop, field production

2005 Prince Edward Island field results for canola yield and quality. D. MacDonald¹, C. D. Caldwell^{1,2}, P. Boswall³, R. Coffin⁴, and M. Webber⁴. ¹Nova Scotia Crop Development Institute, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3; ²Department of Plant and Animal Sciences, Nova Scotia Agricultural College, PO Box 550, Truro, Nova Scotia, Canada B2N 5E3; ³Prince Edward Island Department of Agriculture, Fisheries and Aquaculture, 440 University Ave., Charlottetown, Prince Edward Island, Canada C1A 4N6; ⁴Cavendish Farms, P.O. Box 3500, Summerside, Prince Edward Island, Canada C1N 5J5.

The production of canola for oil in Prince Edward Island has gained considerable interest as growers look for alternative crops to fit in the potato rotation which will bring a higher return. In 2005 NSCDI, Cavendish Farms and the PEIDAFSA carried out various scale evaluations of several canola varieties at numerous sites across Prince Edward Island. The grand mean for yields for small plot replicated trials at AAFC, Harrington research site was 2.8 t ha⁻¹ with a range of 2.4 to 3.2 t ha⁻¹ between varieties. Larger scale replicated plot yields at the Cavendish Farms, New Annan research

site ranged from 2.5 to 3.3 t ha⁻¹. Yields in the 1-acre blocks at Cavendish Farms ranged from 1.8 to 2.1 t ha⁻¹. Cavendish Farms and PEIDAFAs on farm pilot scale yields ranged from 1.4 to 2.5 t ha⁻¹ and 1.7 to 2.1 t ha⁻¹, respectively. Oil percent for the canola grown on farm was very good, ranging from 40–45%.

Key words: Canola, yield, oil percent, oil quality

Evaluation of sunflower varieties under maritime climatic conditions (for oil content and/or bird feed market). K. E. Glover¹, P. Boswall², J. van Roestel³, W. Thomas³, K. M. Perrin¹, S. A. E. Fillmore⁴, and K. B. McRae⁴. ¹Azar Agriculture Incorporated, 90 Research Drive, Truro, Nova Scotia, Canada B2N 6Z4; ²Prince Edward Island Department of Agriculture and Fisheries, PO Box 1600, Charlottetown, Prince Edward Island, Canada C1A 7N3; ³AgraPoint International Inc., 199 Innovation Dr., Truro, Nova Scotia, Canada B2N 6Z4; ⁴Agriculture and Agri-Food Canada, Kentville Research Station, Kentville, Nova Scotia, Canada B4N 1J5.

Sunflower seed production has traditionally been centered in western Canada. In addition to the increased market for bird seed, Maritime producers are exploring advanced technology related to

the extraction of oil from oleaginous seed crops. Eighteen hybrids were tested in the 2000 and 2001 growing seasons in Nova Scotia and seven were evaluated in 2002 and 2003 in Prince Edward Island. The hybrids were evaluated for quality, adaptability, productivity, and tolerance to the fungal disease, sclerotinia. The results indicate the ability of oil type sunflower hybrids to mature within the short growing season. There was a significant difference in days to flower and days to harvest. All of the hybrids matured within 125 d from seeding. Production parameters (yield, oil content, kernel density and kernel weight) of the best performing hybrids were within the range of sunflower grown in Manitoba. Yield ranged significantly among the hybrids evaluated. The hybrids with the earliest harvest dates had low yields (1.07 to 1.37 t ha⁻¹) and required 106 and 113 d to mature. The highest yielding hybrids (2.27 to 3.26 t ha⁻¹) required 125 d to mature. Bird damage affected sunflower yields at 7 of the 15 evaluation sites, but birds caused significant damage at two sites only. There was no evidence of sclerotinia infection at any of the sites during the four growing seasons of this study.

Key words: Sunflowers, *Helianthus annuus*, bird seed, oil extraction, grain quality

ERRATUM

Basu et al. 2006. **Seed yield improvement in fenugreek (*Trigonella foenum graecum* L.) using mutation breeding.** *Can. J. Plant Sci.* **86**: 188 (Abstr.).

The wrong abstract was printed in the journal. The correct abstract is printed below.

Graduate student competition

Variability in seed characteristics among fenugreek (*Trigonella foenum graecum* L.) accessions grown under dryland and irrigated conditions in southern Alberta. S. K. Basu¹, S. N. Acharya², and J. E. Thomas¹

¹Department of Biological Sciences, University of Lethbridge, 4401 University Drive, Lethbridge, Alberta, Canada T1K 3M4; ²Agriculture and Agri-Food Canada, Research Centre, 5403 - 1st Avenue South, Lethbridge, Alberta, Canada T1J 4B1.

Fenugreek (*Trigonella foenum graecum* L.) is an annual forage legume crop with adaptation to dryland conditions. In western Canada, Tristar fenugreek developed for forage production does not produce high-quality seed. With a view to improve seed quality and yield, seed from 83 and 65 accessions was seeded under irrigation and dryland, respectively, in early May 2004. In both tests, the genotypes were planted using two times replicated RCBD. Each plot consisted of a single row plot (3 m) where 120 seed were planted. The plots were hand harvested in fall 2004. Seed yield, colour and size of the accessions varied under the two locations and presence of genotype × environment interaction was observed. Seed yield was higher under dryland than irrigation. The correlation coefficient between seed yield in dryland and irrigated condition was positive and significant ($r = 0.54$; $P < 0.05$) indicating relatively small environmental effect on seed yield. The present experiments helped us identify genotypes with determinate growth habit, early flowering and the ability to produce high seed yield under southern Alberta growing conditions.

