Prairie Province Certified Crop Advisor
Performance Objectives
For February 5, 2010 Exam

Introduction

The Certified Crop Adviser (CCA) program requires applicants to pass two exams; an international exam and a state/province or regional exam. The American Society of Agronomy1 publishes performance objectives which outline the knowledge and skills covered by the International exam. The Performance Objectives outlined in this booklet represent the information and skills covered on the Prairie Provinces CCA exam.

The Exam Committee, under the direction and approval of the Prairie CCA Board, developed these performance objectives. In addition, numerous people involved in crop advising in the Prairie Provinces reviewed them. This booklet will help you prepare for the Prairie Provinces CCA exam. All of the questions on this exam are based on these performance objectives.

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Nutrient Management

1. Explain how soil pH affects symbiotic N fixation.

2. Describe effective practices for managing high and low pH soils.

3. Describe how clay and organic matter affect the cation exchange capacity (CEC) of a soil.

4. Describe how CEC affects inherent soil fertility.

5. Recognize soils with high, medium and low CEC.

6. Describe the soil conditions and fertilizer management that stimulate or inhibit mineralization, immobilization, nitrification, denitrification, symbiotic N fixation, nitrate leaching and volatilization.

7. Describe how prairie fall and winter conditions and the spring thaw period affect mineralization, immobilization, nitrification and denitrification and nitrate leaching.

8. Describe deficiency symptoms for N, P, K and S in cereals, canola, flax, peas, alfalfa and forage grasses.

9. Explain how soil physical and chemical properties and environmental conditions affect macro and micro nutrient availability and movement in soil.

10. Describe the roles of N, P, K, and S in plants.

11. Describe micronutrient deficiency symptoms of:
    - Zinc in corn, flax and beans
    - Boron in alfalfa and canola
    - Manganese in cereals
    -Copper in cereals

12. Identify soil and environmental factors that cause Zinc, Manganese, Boron and Copper deficiencies.

13. List positive and negative impacts of plowed down crops (green manure, forage termination, frosted, hailed, etc).

14. Describe how nutrient credits from animal manure, biosolids, legumes, and cover crops influence fertilizer recommendations.

Fertilizer Forms and Application

15. Explain the advantages and disadvantages of band, broadcast and seed-placed fertilizer application methods.

16. Describe the physical form, analysis, handling precautions, advantages and disadvantages of the common sources of N, P, K, & S used on prairie crops.

17. Describe the attributes of the following fertilizer(s) and fertilizer amendments:

    - ESN
    - Agrotain
    - Avail
    - Provide
    - BioBoost

18. List factors that affect seed-placed application rates of the following materials:

urea	UAN (28-0-0 or 32-0-0)
ammonium nitrate	Agrotain coated urea
anhydrous ammonia	ammonium sulphate
ESN	elemental S
monoammonium phosphate	blends of these products

19. For N, P, K, S fertilizers on prairie crops describe factors affecting:
    - pre or post emergent timing
    - placement method (band, broadcast, seed-placed and foliar)
    - application rates

20. Describe the mechanisms of action and utilization of ESN and Agrotain.

21. Describe the effective application of ammonium sulphate versus elemental S versus ammonium thiosulphate.

22. Describe advantages and disadvantages associated with surface broadcast, broadcast and incorporated, seed placed, banded and foliar applications of boron, copper, manganese and zinc fertilizer materials.

23. Describe the principles of nitrous oxide emissions from agricultural sources and practices for mitigation.

24. Describe the effect of nutrient management practices on surface and ground water quality.

25. Describe efficiency of application, potential soil interactions and limitations for seed placed, band, and broadcast applied P.

26. Explain the factors that limit blend compatibility of common granular fertilizers.

27. Calculate the amount of fertilizer nutrients necessary for preparing a complete blend and the analysis of the blend for granular and liquid fertilizers.

28. Calculate the application rate of a given blend necessary for meeting a soil test recommendation.

29. Calculate the cost per pound of a given nutrient or blend from the analysis and cost per tonne.

30. Explain why fertilizer bulk density is important to blender and application equipment calibration.

Soil and Plant Analysis

31. Indicate the type of information obtained from surface and sub-surface soil sampling depths.

32. Describe the limitations of surface soil sampling for developing a fertilizer recommendation.

33. Explain how farmers and advisors use soil sampling and plant tissue analyses to diagnose plant growth problems.

34. Explain the effect of soil electrical conductivity (E.C.) values on plant growth.

35. Use soil test information to make economically and environmentally sound fertilizer recommendations.

36. Describe common philosophies used by soil testing labs to make fertilizer recommendations (soil building, replacement and sufficiency).

37. Describe the following recommended soil sampling and handling procedures:
    -time of sampling
    -depth of sampling

-frequency of sampling
-sample density
-sampling pattern (including random, benchmark, grid and topographic methods)

38. Describe the following recommended procedures for taking and handling plant tissue tests:
    - growth stage for sampling
    - frequency for sampling
    - plant portion sampled
    - sampling density.

39. Distinguish between extractable, plant-available and total soil nutrient levels.

40. Explain how root ion exchange membranes are used to estimate nutrient availability.

41. Interpret a soil test report.

42. Describe the differential nutrient requirements for various crops or market classes:
    a. malt versus feed barley
    b. high protein wheat classes
    c. hybrid versus open pollinated canola varieties
    d. canola and pea phosphorous uptake versus cereals

Regulations

43. Describe the role of the Canadian Food Inspection Agency in registering nutrient products, ensuring fertilizer product quality, and explain the purpose of the Fertilizer Act.

44. From the Fertilizer Act define the following:
    - guaranteed analysis
    - mixed fertilizer
    - soil amendment
    - major plant nutrient

Soil & Water Management

Soil Characterization, Classification and Mapping

1. Describe the soil zones, climate and vegetation of the prairie region.

2. Compare the differences in potential crop productivity and crop adaptability among the major soil zones.

3. Describe management practices and soil conditions that increase the risk of agricultural pollution.

4. Describe applications of the following basic coordinate systems:
    - legal survey system used in Canada's Prairie provinces
    - latitude /longitude (their application to GPS and GIS mapping)

5. Describe the characteristics and key distinguishing features of the most common soil orders on the prairies (Chernozemic, Luvisolic, Gleysolic, Solonetzic and Organic).

6. Define a soil association and how it is used on a soil map.

7. Describe the effect that topography has on soil development, horizon thickness, soil organic matter, soil pH, and available nutrients.

Water

8. Explain the following terms as they apply to irrigation water:
    - leaching requirement
    - sodium adsorption ratio
    - electrical conductivity
    - total dissolved solids

9. Define soil texture, bulk density, structure, soil tilth and explain their relationship(s) to soil porosity and soil water.

10. Explain how the following practices can be used to manage soil water more effectively:
    -snow trapping
    - summerfallowing
    - tillage systems
    - irrigation
    - crop rotation

11. Describe the advantages and disadvantages of the following practices for managing excess water.

- surface drainage
- sub-surface (tile) drainage
- cropping systems

Soil Properties, Problem Soils and Management of Problem Soils

12. Explain how changes in the landscape of a field can affect management decisions.

13. Explain the causes of soil salinization in the prairie soils.

14. Describe the following:
    - side-hill seep
    - regional or artesian discharge
    - bathtub or evaporitic ring
    - irrigation salinity

15. Define soil organic matter and describe its relationship to soil colour, structure, nutrient supply and the soil ecosystem.

16. Explain how environmental conditions and agronomic practices affect soil organic matter.

17. Describe symptoms of compacted soil and surface crusting, and their effects on crop production.

18. Describe the characteristics and management practices of:
    - saline soil
    - sodic (alkali) soil
    - solonetzic soil

Tillage and Residue Management

19. Describe tillage systems and crop rotations that optimize soil residue cover.

20. Describe how texture, tillage and cropping systems affect soil structure.

21. Explain the methods for minimizing soil erosion (wind, water and tillage) and describe their advantages, disadvantages, and relative effectiveness.

22. Describe how nutrient release and fertilizer management differ between conservation and conventional tillage practices.

23. Describe the advantages and disadvantages of straw removal through:

    - baling for industrial use
    - bedding or feeding to livestock
    - burning

Manure Management

24. Identify nutrient losses associated with different methods of manure handling (including composting), storage and application.

25. Describe the relative amounts, forms (organic vs inorganic) and relative availability of nutrients in liquid, solid and composted manure.

26. Describe factors influencing the rate of nutrient release from manure and the microbial process involved.

27. Identify factors that influence the quantity and form of nutrients in manure.

28. List agronomic, environmental and economic advantages and disadvantages of composting manure.

29. Describe manure sampling and handling procedures to obtain a nutrient analysis.

30. Using a manure analysis report, calculate a manure application rate.

31. Explain how soil properties and cropping practices influence the suitability of soils for manure application.

32. Describe how methods and time of application affect the nutrient release and losses from manure.

33. Describe the basic characteristics of a nutrient management plan, and list the potential benefits.

34. What provincial acts regulate the management of manure and siting of livestock operations in each of the three prairie provinces?

Integrated Pest Management

1. List the principles and practices of integrated pest management.

2. Describe the methods for sampling and submitting plant and pest material for diagnosis and laboratory analysis.

3. List the advantages and limitations of adopting an IPM program.

4. Define action threshold and economic threshold and identify the factors that determine each in pest management.

Spray Equipment and Pesticide Safety

5. List the steps involved in calibrating a sprayer and perform calculations to determine sprayer output and pesticide application rate.

6. Describe the environmental and mechanical factors that affect spray drift.

7. Calculate an application rate for a pesticide from a label.

8. List and prioritize in order of toxicity common points of entry of pesticide into the body.

9. Explain recommended methods for pesticide handling, storage, transport, loading, mixing, tank decontamination, spill clean-up, container cleaning and disposal.

10. Categorize pesticide risk based on hazard symbols and LD50.

11. Recognize the personal protective equipment as identified on a pesticide label or material safety data sheet (MSDS).

Weed Management

12. Recognize the seedling stage and describe the:
    a) life cycle
    b) means of reproduction
    c) seed longevity
    d) competitive ability
    e) key management strategies and control methods
    f) distinguishing plant morphological features
    g) noxious classification according to Canada Seeds Act for the following weed species:
        1. wild oat

2. green foxtail
3. wild buckwheat
4. barnyardgrass
5. wild mustard
6. annual smartweed
7. lamb's quarters
8. kochia
9. redroot pigweed
10. Canada thistle
11. volunteer canola
12. flixweed
13. stinkweed
14. perennial sowthistle
15. quack-grass
16. stork's-bill
17. hemp-nettle
18. common chickweed
19. cleavers
20. dandelion
21. foxtail barley

13. Describe non-chemical means of weed management.

14. Describe how contact and systemic herbicides common in western Canada differ with regard to:
    - application technique
    - mode of action
    - symptomology
    - weed selectivity

15. Describe how the following factors affect herbicide efficacy:
    - weed size and growth stage spray volume
    - plant canopy density and competitiveness water quality
    - addition of surfactants and additives rain-free period
    - temperature relative humidity

- ultraviolet light herbicide rate
- compatibility with other pesticides

16. Describe how the following factors affect herbicide persistence in the soil:
    - soil pH soil organic matter
    - soil temperature soil moisture
    - clay content herbicide volatility
    - incorporation method

Disease Management

17. Recognize the:
    a) symptoms
    b) key management strategies
    c) control methods

    for the following diseases:

    <u>Cereals</u>
    - ergot
    - tan spot
    - loose smut
    - bunt
    - fusarium head blight
    - common root rot
    - take-all root rot leaf rust
    - net blotch
    - scald septoria leaf spot
    - glume blotch

    <u>Canola</u>
    - blackleg
    - sclerotinia (stem rot)
    - alternaria (black spot)

    <u>Lentils</u>

    - ascochyta

- botrytis (gray mold)

Peas

- mycospherella
- powdery mildew

18. Describe how host, pathogen and environment interact to cause outbreaks of:
    - tan spot, Septoria and Fusarium head blight in cereals,
    - sclerotinia in canola
    - powdery mildew in peas.

19. Describe the differences between contact vs. systemic, and eradicant vs. protectant fungicides.

20. Contrast seed treatments commonly used in Western Canada by insects and diseases controlled.

Insect Management

21. Recognize the:
    - insects
    - symptoms of infestation
    - key management strategies
    - conditions that lead to outbreak

    for the following insects:

Cereals

- wheat midge
- wheat stem sawfly
- rusty grain beetle

Canola

- flea beetle
- diamond back moth
- root maggot
- bertha armyworm

General Feeders

-aphids

-cutworms

-grasshoppers

-lygus bug

-wireworms

22. Recognize the immature and adult stages of the following beneficial insects and their prey:

    - ladybird beetle hover fly

    - carabid beetle (ground beetle) lacewings

    - minute pirate bugs

23. Describe the effect of temperature, moisture and wind on insect dispersal and control measures on: flea beetle, diamond back moth, wheat midge and grasshoppers.

24. List steps to reduce the risk of honeybee death from pesticide application.

Pesticide Resistance

25. Explain how to recognize and confirm cases of pesticide resistant weeds, insects and diseases.

26. List the factors that contribute to the development of pesticide resistance in weeds, insects and diseases.

27. Describe management techniques that delay pesticide resistance development, and reduce existing resistant populations.

28. Define multiple resistance in pests, including volunteer GMO crops.

29. Describe the mode of action and categorize according to resistance grouping the following herbicides:

    - 2,4-D

    - Assert (imazamethabenz)

    - Attain (fluroxypyr and 2,4-D ester)

    - Achieve (tralkoxydim)

- Banvel (dicamba)
- Buctril M (bromoxynil and MCPA)
- Curtail M (clopyralid and MCPA)
- Edge (ethalfluralin)
- Everest (flucarbazone-sodium)
- Frontline (florasulam and MCPA ester)
- glyphosate
- Horizon (clodinafop-propargyl)
- Liberty (glufosinate ammonium)
- Odyssey (imazamox and imazethapyr)
- Poast Ultra (sethoxydim)
- Puma Super (fenoxaprop-p-ethyl)
- Refine Extra (thifensulfuron methyl + tribenuron methyl)
- Sundance (sulfosulfuron)

Fungicides:

- Tilt (propiconazole)
- Quadris (azoxystrobin)
- Roval Flo (iprodione)
- Ronilan (vinclozolin)
- Bravo (chlorothalonil)
- Dithane (mancozeb)

Insecticides:

- Lorsban (chlorpyrifos)
- Decis (deltamethrin)
- Sevin (carbaryl)
- Matador (cyhalothrin-lambda)
- malathion
- Counter (terbufos)
- Thiodan (endosulfan)

Regulations

30. Explain the sections of a pesticide label as described under the Pest Control Products (PCP) Act.

31. List sources of information about your province’s pesticide laws.

32. List record keeping requirements related to pesticide application.

Crop Management

General

1. Recognize and prioritize the soil and environmental factors limiting prairie crop production.

2. Recognize the advantages and disadvantages of fall versus spring field management practices.

3. Recognize the relationship between maximum economic yield and fertilizer use.

Seeding

4. List the factors that influence the seeding rate, depth and date of small grains, oilseeds, pulses, grasses and legumes.

5. Calculate seeding rates for desired plant populations.

6. Describe the purpose of seed treatments.

7. Describe inoculant materials and handling methods for forage legumes and pulse crops.

8. Describe factors affecting crop variety selection.

9. Recognize the advantages and disadvantages of fall seeded crops

Seeds Act

10. Distinguish among bin run, common, pedigreed, certified, registered, foundation, breeder and select seed as defined in the Canada Seeds Act.

11. Interpret a seed analysis report from an accredited laboratory and define percent germination and seed vigor. Describe the difficulties in interpreting seed vigor tests.

12. List the rights and limitations of the Plant Breeders Rights Act on breeders, seed sellers and crop producers.

13. Describe the role of each of the following participants in the seed industry: Agriculture and Agri-Food Canada, Canadian Food Inspection Agency, Canadian Seed Growers Association, Canadian Seed Institute, Private Seed Companies, SeCan, Universities.

Growth and Development

14. Describe plant growth and development stages of small grains, oilseeds and pulse crops.

15. Define "growing degree day", describe its use in crop production and calculate growing degree days for small grains and oilseeds.

16. Identify crop damage due to heat, cold, drought, wind and flooding.

17. Identify factors that need to be considered in a replant decision.

18. Describe root pattern differences between cereals and oilseeds.

19. List factors affecting final grain protein content.

20. List factors affecting lodging and management methods to minimize lodging.

Harvest Management

21. Determine when small grains, oilseeds and pulses are physiologically mature, ready to desiccate and ready to swath.

22. Describe harvest management systems for cereals, oilseeds and pulses.

23. Recognize how harvesting equipment operation, drying temperature, handling, storage time and storage conditions affect seed quality.

24. List moisture levels for the safe storage of cereal, oilseed and pulse crops and identify strategies for managing tough and damp grain.

Crop Rotations

25. Compare the advantages and disadvantages of a monoculture cropping with multiple cropping systems.

26. Identify cropping systems most appropriate for the major soil zones.

27. List the advantages and disadvantages of summer fallow.

Forage Management

28. Recognize conditions when seeding a companion crop with a forage crop is appropriate.

29. Define forage quality and recognize when to harvest for maximum quality and /or dry matter production.

30. Identify forage harvesting & storage systems used in Western Canada, and the losses that occur in each.

31. Identify the value of grass and legume mixtures in a pasture stand.

32. Describe the relationship between a forage crop's maturity and animal consumption & utilization.

Precision Farming

33. Define the term Global Positioning System (GPS) and list the components of GPS.

34. Define the term Geographic Information System (GIS) and describe the forms of information that may comprise a GIS.

35. Describe the operation of a typical yield monitor and its association with GPS and GIS.

36. List the possible roles of precision farming tools in field scouting.

37. List the potential uses of GPS in field monitoring and record keeping.

Regulations

38. Recognize what it means to be a "Professional Agrologist (P.Ag.)", define "the practice of agrology" as outlined by provincial legislation and recognize the legislated rights of what constitutes practicing agrology.

Key Resources

- Prairie Provinces Exam
- Prairie Provinces Certified Crop Adviser Study Guide. 2003.
- Assiniboine Community College, 1430 Victoria Avenue, Brandon, MB R7A 2A9. Phone (204)-726-6627, Fax (204)-726-7014

Nutrient Management

- Soil Fertility Manual. 2002. Potash & Phosphate Institute.
- Soil Fertility Guide, 1999. Manitoba Agriculture and Food, Soil and Crops Branch, Box 1149 Carman MB, R0G 0J0
- Nitrogen, Phosphorus, Potassium, Sulfur: Answers to your questions. 1993. Campbell, C.A., Rennie, D. A., and Bailey L.D. Agriculture Canada, Ottawa, ON. 48 p.
- Nutrient Uptake and Removal by Field crops – Western Canada 1998.
- Canadian Fertilizer Institute.

Soil & Water Management

- The Health of Our Soils. Toward sustainable agriculture in Canada. D.F. Action and L.J. Gregorich (editors). Agriculture and Agri-Food Canada Publication 1906/E. 1995
- Nitrates in groundwater: A review of literature. Henry, J.L., and Meneley, W.A. 1993.
- Soil Organic Matter. 1985. Alberta Agriculture Agdex No. FS536-1
- Residue Management for Successful Direct Seeding. 1996. Alberta Agriculture Agdex, No FS570-4
- Zero Tillage. Advancing the Art. Manitoba-North Dakota Zero Tillage Farmers Association. 1997. 40p.
- Direct Seeding Manual. Produced by: PAMI (Prairie Agriculture and Machinery Institute) And SSCA (Saskatchewan Soil Conservation Association).
- Understanding Western Canada's Dominion Land Survey System. R.B. McKercher and B. Wolfe, 1986. U-Learn Center, Extension Division, Room 125 Kirk Hall, 117
- Science Place, University of Saskatchewan, Saskatoon, SK S7N 5C8.
- Prairie Agricultural Landscapes – A Land Resource Review. 2000.
- Tri-Provincial Manure Application and Use Guidelines. 2003. In press. 47 p.

Integrated Pest Management

- Diseases of Field Crops in Canada. Martens, J.W., Seaman, W.L, Atkinson, T.G. 1988.
- Canadian Phytopathological Society. 160 p.
- Insects of the Prairies. Philip, H. and E. Mengerson.
- Recognizing herbicide action and injury. Alberta Agriculture. Publishing Branch. 7000-113 St. Edmonton. Alberta T6H 5T6.
- Weeds of the Prairies. Alberta Agriculture, Food and Rural Development, Agdex 640-4
- Weed Seedling Guide. 1996. Alberta Agriculture, Food and Rural Development, Agdex 640-9
- Guide to Crop Protection. (Current Year). Manitoba Agriculture and Food. Soils and Crops Branch, Box 1149, Carman, MB. R0G 0J0
- Crop Protection with Chemicals (Current Year). Alberta Agriculture, Food and Rural Development, Agdex 606-1
- Crop Protection Guide. Saskatchewan Agriculture and Food. (Current year). Saskatchewan Agriculture and Food, Regina, SK 185 p
- Field Scouting Guide. 2002. Manitoba Agriculture and Food, Soils and Crops Branch, Box 1149, Carman MB. R0G 0J0
- Applied Weed Science, Ross and Lembi Burgess Publishing, ISBN 0-8087-2958-6
- Insect storage in stored Grain – A Producer's Guide, Canadian Grain Commission 1988
- Natural enemies of pests associated with prairie crops. Publication 1895E,
- Agriculture and Agri-Food Canada, 1993.

Crop Management

- Alberta Forage Manual. Alberta Agriculture, Food and Rural Development. Agdex 120/20-4
- Alternative Crops for the Prairies. Kiehn F. A., and Reimer M. 1993. Agriculture
- Canada Pub. 1887/E. Communications Branch, Ottawa, ON. 46 p.
- Crop Rotation Studies on the Canadian Prairies. Campbell, C.A., Zentner, R.P. Janzen,
- H. and Bowren K. E. 1990. Agriculture Canada Pub. 1841/E. Ottawa, ON, 133 p.

- Pulse crop production manual. Saskatchewan Pulse Crop Development Board. 1995.
- Saskatchewan Pulse Crop Development Board.
- Soil Improvement with Legumes. Green, B.J., and Biederbeck V.O. (eds). 1995
- Farm Facts. Saskatchewan Soil and Crop Management Sub council. Pub.
- #15M 03/95. Regina, SK. 19 p. Canola Growers Manual, Canola Council of Canada.
- Winter Wheat Growers Manual. D.B. Fowler, Crop Development Centre, University of Saskatchewan, Saskatoon, SK S7N 5A8
- Wheat Risk Management Guide, Field Scouting Guide, Wheat Production Reference Manual. 1992. Canada Grains Council, 760 - 360 Main Street, Winnipeg, MB
- Field Crop Production Guide. 1998 Manitoba Agriculture and Food, Soils and Crops Branch, Box 1149, Carman, MB R0G 0J0
- Regulations and Procedures for Pedigreed Seed Crop Production. CSGA Circular 6.
- Contact your local provincial extension department, College of Agriculture, or community college for additional reference materials.

International Exam

- National Certified Crop Adviser Performance Objectives. 2003. A. Seibert and J. Vorst. American Society of Agronomy, 677 South Segoe Road, Madison, WI 53711 Phone (608) 273-8080. http://www.agronomy.org/cca/
- Preparing for the 2003 International Certified Crop Adviser Exam. John T. Gilmour, Potash & Phosphate Institute, Norcross, GA Phone (770) 825-8082.
- http://www.store.yahoo.com/ppi-store/ccamanual.html ($40 US)
- International CCA Prep Book. 2003. Agri Business Group. 3905 Vincennes Road, Suite 402, Indianapolis, IN 46268. Phone (317) 415-0500 ($120 US)
- Soil Fertility Manual. 2002. Potash & Phosphate Institute, Norcross, GA Phone (770) 447-0335. http://www.store.yahoo.com/ppi-store/soilferman.html ($20 US)
- Western Fertilizer Handbook. 1995. Eighth Edition. California Fertilizer Association. Interstate Publishers, Inc. P.O. Box 50, Danville, IL. 61834-0050. Phone (800) 843-4774

Useful Internet Sites

- Prairie Certified Crop Advisor Program
  - http://www.pcca.ca
- Certified Crop Adviser Program
  - http://www.agronomy.org/cca
- Canada's Agrifood Directory
  - http://www.caffeine.ca
- Agriculture and Agri-Food Canada's Electronic Information Service (ACEIS)
  - http://www.agr.ca
- Agriculture and Agri-Food Canada Research Branch
  - http://aceis1.ncr.agr.ca/research/branch/index.html
- Manitoba Agriculture and Food
  - http://www.gov.mb.ca/agriculture
- Saskatchewan Agriculture and Food
  - http://www.gov.sk.ca/agfood
- Alberta Agriculture, Food and Rural Development
  - http://www.agric.gov.ab.ca
- Ontario Ministry of Agriculture and Food
  - http://www.gov.on.ca/OMAFRA
- Health Canada's Pest Management Regulatory Agency
  - http://www.hc-sc.gc.ca/pmra
- Farm Business Management Information Network
  - http://www.fbminet.ca
- Agriculture Online
  - http://www.agriculture.com

Agriculture Resource Sites

http://www.open.uoguelph.ca/IS-350/resources/resources1.html

The Pedosphere and Its Dynamics: A Systems Approach to Soil Science

http://www.pedosphere.com/

Cereal crop management

http://www.smallgrains.org/

Stored grain insects

http://res2.agr.ca/winnipeg/stored.htm

Beneficial insects

http://www.nysaes.cornell.edu/ent/biocontrol/

The Profession of Agrology

Those who work in agriculture are often measured by the professional status given to them through the various provincial Agrologist Acts. The development of those Acts in various jurisdictions determined legal definitions of agricultural professionals and the conduct required of them within the profession. Professional status has been granted the Institutes of Agrologists through the legislative process. It has been deemed appropriate by society that a professional organization exists to protect the interests of the farming community and the general public when it comes to agricultural issues and practices.

The practice of agrology is the key issue, which defines who is an Agrologist and what he or she does as part of the profession.

The Practice of Agrology

"The practice of agrology" is a cornerstone upon which the profession is founded. Anyone can practice agrology, but it is understood that only Agrologists have the legislated right (although not in all provinces) to do so. Only those doctors who are members of a provincial College of Physicians and Surgeons have the legal right to "practice medicine" even if they have a degree in medicine; similarly only those in the legal profession may "practice law" in a province in which they have successfully written that province's Bar exam and met the other necessary requirements as outlined by the Law Society.

Who is Practicing Agrology?

"The Institute of Agrologists are organizations of *university trained professionals that protects the public by ensuring its members are qualified and competent to provide knowledge and advice on agriculture and related areas".

It is important to clarify two key words in this statement. One is the word "protect". This refers to protection from harm. Harm could accrue in a wide spectrum of areas such as economic, health and in the environment. The word "public" refers to any sector of society affected by the actions of practicing Agrologists. Examples include: farmers, agribusiness, consumers, other professions, policy makers and elected officials.

The following two Principles underlie practice:

(a) the practice of agrology requires the application of scientific principles and practices usually learned over a four year degree program2 in a Faculty of Agriculture or closely related degree.

(b) the intent of the Agrologist, as practitioner, is to provide objective, balanced, in-depth information for the purpose of assisting others to make decisions and to affect change.

Clarifying the Term "Supervision" in Relation to the Agrologists Acts
The Agrologists Acts state:

1. No person other than a practicing member shall:

a. practice agrology;

b. carries out the functions of an Agrologist

c. hold himself or herself out to the public as an Agrologist; or

d. uses the title "Agrologist" or any abbreviation, name, title or designation that may lead the public to believe that the person is a practicing member.

2. No person other than a member registered as an articling Agrologist or Agrologist in training shall use the title "articling Agrologist" or any abbreviation, name, title or designation that may lead the public to believe that the person is an articling Agrologist.

3. Clauses (1) (a) to (c) from above do not apply to:

a. A person carrying on the business of farming;

b. An undergraduate student working under the supervision of a practicing member;

c. A person, or his or her agent, who gives advice based on information provided to him or her by a practicing member, regarding the quality or use of a product or

service that he or she offers for sale; or

d. An agricultural technician or technologist who works under the supervision of a practicing member.

Post Secondary Training (Manitoba only)

As noted in the Act, individuals who are supervised by a practicing Agrologist may be excluded from being licensed to practice if they are deemed to be delivering information or advice from an Agrologist. Supervision may be direct in a specific staff-line situation and would be identified in the organizational chart. In these situations the individual would be reporting directly to the practicing Agrologist.

In other circumstances, supervision is functional. The individual would be delivering information and advice based on the policy and practices of the organization. For matters relating to agriculture it is the practicing Agrologist within the organization who is responsible for the development of these policies and practices and the information and advice that is relevant. In this situation, the individual is delivering the advice from the Agrologist so is not considered to be practicing and is thus exempt from the Act.

The term "supervision" relates to the role of the individual within the organization or company as defined by the term "practicing agrology". When an individual is specifically attempting to effect change, he or she is practicing. When an individual is being supervised by someone who is practicing, they may give advice but it I the Agrologist who is accountable and who is practicing.

When an individual is attempting to effect change and where he/she is under a contractual arrangement with a company which employs Agrologists, then the Agrologist in the company is accountable and the individual affecting change is exempt under the Act.

This interpretation is drawn from the functional authority within the contract and where the change and information component can be withdrawn by the Agrologist for failure by the person to act in accordance with information or conditions prescribed.

FOR INFORMATION CONTACT:

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