Crop Rotations for Field Crops

Is there really the right rotation to fit every farmer?

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Presentation Sponsor
...with methods of farming in which grasses form an important part of the rotation, especially those that leave a large residue of roots and culms, the decline of the productive power is much slower than when crops like wheat, cotton, or potatoes, which leave little residue on the soil, are grown continuously.

—HENRY SNYDER, 1896
Crop Rotation

- The practice of alternating crops grown on a specific field in a planned sequence in successive crop years so that crops of the same species or family are not continuously grown on the same field.

Definition of Crop Rotation from Canadian Organic Standard

5.4.2 The fertility and biological activity of the soil shall be maintained or increased, where appropriate, by

a. crop rotations, which shall be as varied as possible and include plough-down, legumes, catch crops or deep-rooting plants

(Canadian Organic Standard)
• On PEI – Agricultural Crop Rotation Act

No grower shall plant and no landowner shall permit regulated crops to be planted on any area of land greater than 1.0 hectares at any time for more than one calendar year in any three consecutive calendar years.

A grower may plant and a landowner may permit regulated crops to be planted on land which is subject to a management plan if the grower of the regulated crops adheres to all aspects of the management plan.
• In case you are wondering what to grow, it is hard to go wrong. Stick to your soil conditions and your crop rotation and do not let the market mess up your farm's sustainability.

• (Tom Manley, Homestead Organics)
Reasons for Rotation

- Reduce insect pressure
- Reduce disease pressure
- Reduce weed pressure
- Spreads out labour requirements
- Reduces the risk caused by climate or market
- Increases organic matter
- Increases soil health
Rotation Study

• The Glenlea Long term Rotation Study in Manitoba - Dr. Martin Entz
  – 19 year crop rotation study comparing organic and conventional methods
  – Forage based rotation compared to Annual crop rotation
  – Multiply levels of research being conducted
    • Weed
    • Economic
    • Soil Biology
    • Soil Nutrients Phosphorus
      Annual grain systems do not remove as much P from the soil but may be lower yielding if N supply through green manures is not adequate.
      For long-term sustainability, replacement of P removed by crops is necessary
      Crop yields and soil fertility seem to be sustainable in the organic grain-forage rotation with added manure.
Types of crops

- **Feed**
  - Winter Barley
  - Winter Triticale
  - Winter Canola
  - Winter Wheat both Soft White & Hard Red
  - Winter Spelt

- **Winter or fall seeded crops**
  - Winter Canola
  - Winter Wheat
  - Winter Spelt

- **Summer**
  - Soybeans
  - Lupins
  - Wheat
  - Triticale
  - Barley
  - Oats
  - Camelina
  - Sunflower
  - Flax
  - Canola
  - Mustard
  - Peas

- **Food**
  - Winter Canola
  - Winter Wheat
  - Winter Spelt
  - Soybeans
  - Wheat
  - Oats
  - Sunflower
  - Flax
  - Canola
  - Camelina
  - Peas
Types of Rotations

- 2 year of Clover
- 1 Year of Cereal
- 1 Year of oilseed
- 1 Year of Cereal underseeded to Clover
- 2 years of Clover
- 1 year of Cereal + Peas Followed by
- 1 Year of Winter Cereal Followed by
- Cover/Green Manure Crop
- 1 year of oilseed
- 1 Year of cereal underseeded

- 2 Year of Clover
- In 2nd year Plow in August & Plant winter Cereal
- Plant Cover / Green Manure Crop
- 1 Year of Oilseed
- 1 year of Cereal underseeded
- 2 year of Clover
- 1 year of cereal followed by winter oilseed
- 1 year of winter cereal
- Frost seeded to clover in spring
• 550 ac of organic land

• 5 year rotation
  – 1 year clover
  – 1 year winter wheat or spring wheat
  – 1 year soybeans
  – 1 year barley after manure or compost applied
  – 1 year oats as nurse crop underseeded to clover
Winter Wheat

- Plowed Aug 14, 2012
- Planted Sept 15, 2012
- Finger-weeded Pre Emergence
- Sept 15 2012
Oat cover crop

Planted Oct 6 2012
Nov 12 2012
Spring Wheat
Soybeans and Cultivation
Mixed Cereal – Field Peas, Barley and Oats
Transition New Land

- Renting land
- Starting rotation with green manures
  - Weed control
  - Build available nutrients
- Using Buckwheat, Field Peas and Oats
- Cost
Plowed June 11 2012
Planted Buckwheat & Peas June 18 2012
July 30 2012
Disced Aug 8 2012
Oats, Peas & Buckwheat
• Harvested Winter wheat on Aug 4 2012
• Planted Nitro Radish Aug 16 2012
  – Type of tillage radish
  – Breaks up hard pan
  – Scavenges for nutrients
  – Winter kills leaving a void in Spring
Variations

• Planted Barley May 21, 2012
• July 02 Disced Barley, weed pressure too high
  – Wild Radish
• Planted Buckwheat July 6, 2012
• Swathed Buckwheat Sept 12, 2012
No Till Soybeans into Fall Rye

• Built a Roller for trails
• Flowering was used as the termination date
• Single and Multiple passes where tried
• No till Drill helped to flatten the rye
• New Considerations
  – Using Heading as the termination date
Consideration When Developing a Rotation

- Follow a heavy feeding crop after a legume
- Light feeding crops the second year after legume
- Grow the same annual crop only 1 year in a row
- Sequence crops to control weeds
- Sequence crops for added benefit to following crop
- Add deep rooted crops
- Add crops that leave large amounts of residue
- Consider the benefits of livestock
Developing A Rotation

• Has to work for the Farm (labour)
• Has to make money not at the expense of the soil
• Diverse
  – Confuse weeds (summer and Fall planted crops)
  – Types of crops (legumes, deep rooted and grasses)
• Build Organic Matter and Fertility
Thank You