Nutrient Deficiencies

**Nitrogen Deficiency**
- Yellowing from leaf tip along midrib
- N is mobile in plants, so symptoms appear on lower leaves first
- Indicates N losses, tie up or under-fertilization

See page 23.

**Sulphur Deficiency**
- Sulphur deficiency present in the right side of the photo
- Chlorosis or yellowing occurs in youngest leaves first due to poor mobility of sulphur within plants

See page 41.

**Potassium Deficiency**
- Symptoms appear on lower, older leaves: yellowing or white spots (alfalfa) along leaf margins
- Caused by low soil test or poor root growth (disease, compaction, poor drainage, etc.)

See page 33.

**Response to Phosphorus**

*Source*: Dr. Dave Hooker, University of Guelph, Ridgetown

- Soil test phosphorus: 7 ppm (Olsen)
- Photo: April 13, 2016 (wheat seeded on October 5th, 2015)
- 42 kg/ha P₂O₅ applied in furrow (R), no P applied (L)
- Yield: 112 bushels/acre (with P) vs. 86 bushels/acre (without P)

See page 30.
Internal Calcium Deficiency (Blossom End Rot)

- Low mobility in plant tissues
- Deficiency caused by moisture deficit or high transpiration demand during fruit set — not usually a lack of calcium in the soil or roots

See page 35.

Manganese Deficiency

- Manganese has low mobility in both soil and plant tissue
- Deficiency symptoms can include stunting, interveinal chlorosis
- Most commonly seen on high pH soils, muck soils and eroded soils

See page 44.

Boron Deficiency

- Deficiency symptoms include shortened internodes, leaf discoloration and poor flowering and seed set
- Most common on light-textured soils in dry conditions

See page 45.

Source: Dale Cowan, CCA-ON