Soybean Production in Saskatchewan???

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Soybeans Production Shifting

Change in Soybean Production: 2004-2010

Legend (Bushels)
-3,628,000 - 410,000
-409,999 - 0
1 - 930,000
930,000 - 2,400,000
2,400,001 - 6,044,800
Manitoba Soybean Acreage

Source: Stats Canada; AAFC; MAFRI
Soybeans are **photosensitive**
- Begin to produce flowers when a critical dark period is reached (day length)
- Day length varies with latitude

In the U.S. soybeans are divided into types or groups according to their maturity/photosensitivity, divided into 13 groups
- MG 000 to MG X

In Canada soybean maturity ranked on Corn Heat Units
<table>
<thead>
<tr>
<th>Variety</th>
<th>Site Years</th>
<th>Yield as % of RR Rosco</th>
<th>Corn Heat Units*</th>
<th>Height (cm)</th>
<th>Lodge Rating</th>
<th>Seed Weight (g/1000)</th>
<th>Hilum Colour</th>
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### Soybean Post 2012

Varieties appear 10% or > Higher Yielding than most Pre-2012 Entries

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Varieties 2012-13: Yield vs Maturity

Yield % of 23-10RY vs Days to Maturity

- Varieties 2013
- Varieties 2012
- Varieties 2011
- Varieties 2010
Soybean Establishment

- Treat seed gently, avoid multiple handling especially if seed moisture is low (< 13%)
- Requires good seedbed moisture, seed needs to absorb 50%+ its seed weight to initiate germination
- Seed will swell at 5°C but embryo will not grow until soil temperature is 9°C
- Seeding Date – when soil temperature at depth of seeding = 10°C
- Afternoon planting
Soybean Establishment

Soybeans planted in warm soil (21°) and kept at that temp for 17 days.

Courtesy NorthStar Genetics
Soybean Establishment

Soybeans planted in warm soil (21°) for 8 hours, then kept at 7° for 4 days

Courtesy NorthStar Genetics
Soybeans planted in cool soil (7°C) and kept at 7°C for 20 hours then warmed up to 21°C for 17 days ("cold shock")

Courtesy NorthStar Genetics
Soybean Establishment

• Use a seed treatment, will assist in cold soils and protect from seed rot/seedling loss (research indicates an economic benefit in northern growing regions)

• Seeding depth = \( \frac{3}{4}'' \) to 1.5” (sensitive to deep seeding)

• Roll if stones present or uneven ground
  – Roll prior to emergence
  – If delays in rolling occur (compaction concerns, weather) wait and roll at the 1\text{st} or 2\text{nd} trifoliate stage
Soybean Yield vs Plant Population

Suggested population of 45 plants/m² (180,000 plants/acre)
Soybean Establishment

- Seeding rate (irrigated production)
  - ≈180,000 plants/ac solid seeded (9-12’)
  - ≈160,000 plants/ac row cropped (22”)
  - Varieties differ in seed weight (2200 – 3000 seed/lbs), calibrate seeder accordingly
  - Plants adjust to lower planting density by increasing branching and the number of pods on branches and main stem
    - < elastic in yield than canola
    - > maturity
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Soybean Establishment

- **Spring Frost**
  - Soybean growing point emerges above ground so susceptible to frost
  - Axillary buds develop at cotyledons and each leaf axil, so recovery possible
  - If frost extends below cotyledons plant death occurs

- **Fall Frost**
  - If mature then no loss in yield or quality
  - If before maturity then yield loss, green seeds, lower quality and variable moisture
Pod Clearance

Increased Clearance
- Warm soils
- Quick emergence
- Shallow seeding
- Higher seeding rate
- Seed treatment

Decreased Clearance
- Cold soils
- Slow emergence
- Deep seeding
- Low seeding rate
- No seed treatment
• Inoculation Critical
  – No native bacteria present
    – Maximum rate (or >) of a seed applied peat or liquid soybean inoculant
  – If capable use in conjunction with full rate (or >) of granular soybean inoculant
Fertility

• Phosphorus
  – Sensitive to seed placed fertilizer (salt effect), position P away from seed if possible, limit to 10-15 lbs. P$_2$O$_5$/ac if good soil moisture
  – Side band applications
  – Fall or spring broadcast
  – Additional P applied to proceeding crop
  – Very effective soil P scavenger

• K, S and micro’s unlikely required (yet?)
Pest Control

• Weeds – soybean is a poor competitor in early growth
  – RR Varieties (95% MB acreage)
    • Pre-seed burn-off
    • Post-emergent applications at unifoliate stage to 3rd trifoliate
    • Later application depending on weed pressure
    • Conventional chemistry if volunteer RR canola is an issue
    • Spray in warm conditions while plants actively growing
  – Conventional Varieties
    • Consult “Guide to Crop Protection”
Pest Control

• Disease
  – Use a seed treatment (we are seeding into cool conditions)
    • Soybean affected by pythium, rhizoctonia and fusarrium like canola and peas
      – Sclerotinia (scout fields and be prepared to apply fungicide if disease conditions warrant)

• Insects
  – Wireworms
  – Grasshoppers
Irrigation

• No irrigation recommendations or scheduling yet developed for SK
• Soybeans handle “wet feet” better than other pulse or oilseed
• Maintain soil moisture during vegetative growth to avoid drought but US experience & research indicates no appreciable yield advantage above that from irrigation applied only during reproductive development
Estimated Water Requirements

- **Water Use (Inches/Day)**

- **Pod Development**
- **Pod Filling**

- **Critical period**

- Adapted from C. Duand, NorthStar Genetics
Maturity & Harvest

• Plants mature when 95% of pods have turned “buckskin,” seed rattles in pod
• Your likely going to be waiting for a killing frost
• Can be combined at 20% moisture but better to allow dry down to ≈ 14%
• Pods do not easily shatter and lodging likely not to be a concern
• Leave beans to later if you have a more weather vulnerable crop to deal with
Maturity

- 5% Yellow Pod
- 95% Yellow Pod (Can be brown or tan colour)
- 95% Mature Pod
Harvest

- Slower cylinder speeds and wider concave settings reduce internal cracking
- Flex header ideal (air assist reel a bonus)
- Splits and cracks not as big an issue in marketing as other crops (allowed ≈ 15% split/cracked and 5% green seed)
- Monitor harvest loss (4 seeds/ft² = 1 bushel/ac)
- Store at 13% seed moisture (11% over winter storage)
Conclusions

1st Soybean Crop

- Limit acreage
- Start with lower CHU varieties
- Calculate seeding rate by target population and adjust for seed weight and germination
- Use a seed treatment and double inoculate (ensure seed treatment and seed inoculant are compatible – check planting window)
- Wait to soil temperature reaches 10°C
- Patience required for maturity….go fall fishing!