IHARF Soil & Crop Management Seminar
February 5, 2013
Southey, SK

2013 Agronomy Update
Chris Holzapfel, MSc, PAg

IHARF Soil & Crop Management Seminar
February 5, 2013
Southey, SK
Flax Tour 2013

Optimizing Flax Yield

SaskFlax

IHARF

Agriculture Demonstration of Practice and Technologies (ADOPT)

Canada

Saskatchewan

Indian Head Agricultural Research Foundation

Real Growth Real Opportunity
1) Flax Varieties
2) Seeding Rates & Dates
3) Seed Treatments
4) Fertilizer Management
5) Broadleaf Weed Control
6) Response to Fungicide
Seeding Dates

1. Early May (11th)
2. Late May (29th)

Seeding Rates

1. 40 kg ha\(^{-1}\) (35 lbs/ac)
2. 55 kg ha\(^{-1}\) (49 lbs/ac)
3. 70 kg ha\(^{-1}\) (62 lbs/ac)
SEEDING DATES & RATES EFFECTS ON FLAX EMERGENCE

Rate: $P = 0.031$
Date: $P < 0.001$
$R \times D: P = 0.257$

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SEEDING DATES & RATES EFFECTS ON FLAX YIELD

Seed Yield (bu/ac)

- EARLY
- LATE

Rate: $P < 0.001$

Date: $P = 0.150$

R x D: $P = 0.609$

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SEED TREATMENT EFFECTS ON FLAX EMERGENCE

Site: P < 0.001
Trt: P = 0.014
S x T: P = 0.804
SEED TREATMENT EFFECTS ON FLAX SEED YIELD

Site: $P = 0.025$
Trt: $P = 0.447$
S x T: $P = 0.120$

**IH-13**

<table>
<thead>
<tr>
<th>Condition</th>
<th>IH-13 Yield</th>
<th>NUTR Yield</th>
<th>FUNG Yield</th>
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**ME-13**

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**AVG**

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<tr>
<td>Fertilizer Treatments</td>
<td></td>
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<tr>
<td>-------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>1. 0-0-0-0</td>
<td>7. 90-15-0-0 SB</td>
</tr>
<tr>
<td>2. 45-0-0-0</td>
<td>8. 90-15-8-8 SB</td>
</tr>
<tr>
<td>3. 45-15-0 SB</td>
<td>9. 90-15-0-0 SP</td>
</tr>
<tr>
<td>4. 45-15-8-8 SB</td>
<td>10. 90-15-8-8 SP</td>
</tr>
<tr>
<td>5. 45-15-0-0 SP</td>
<td>11. 90-30-0-0 SB</td>
</tr>
<tr>
<td>13. 90-30-0-0 SP</td>
<td>14. 90-30-15-15 SP</td>
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</table>
Field trials located 3 miles NE of Indian Head, SK (R.M. #156)

Indian Head Heavy Clay, Rego Black Chernozem

Bethune flax seeded May 11 at 45 lb/ac rate into wheat stubble

Seeded w/SeedMaster drill on 12” row spacing (6.3% SBU)

All N side-banded, PKS side-banded or seed-placed
FLAX SEED YIELD
RATE COMPARISONS

bu/ac

NIL vs REST

45N vs 90N

15P vs 30P

P vs PKS

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FLAX SEED YIELD
SIDE-BANDED VS SEED-PLACED

bu/ac

Side-Banded
Seed-Placed

15-0-0 ns 15-8-8 ns 30-0-0 ns 30-15-15 ns

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Herbicide Treatments

1. Check (no broadleaf herbicide)
2. MCPA Ester
3. Authority (sulfentrazone)
4. Authority + Buctril M
5. Buctril (MCPA + bromoxynil)
6. Curtail M (MCPA + clopyralid)
NO HERBICIDE APPLIED

Indian Head 2013 – July 11
WEEDS PRESENT (#/M²)
Indian Head 2013

Herbicide Treatment

- CHECK
- MCPA
- AUT
- AUT+BUC
- BUC
- CUR

- Other
- Brassica
- Buckwheat

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Treatments

1. Check
   - no fungicide

2. 0.16 l/ac Headline
   - full bloom
Site (S): $P < 0.001$
Fung (F): $P < 0.001$
$S \times F$: $P < 0.001$
Do not treat flax as a low input crop & expect consistent top yields

Plenty of competitive varieties available – buy new seed for 2014

Seeding early will usually be your best bet but flax seeded in late May should perform well under most conditions

Flax can respond well to fertilizer applications when residual nutrients are low but will do best in fields with high residual P – limit or avoid seed placement to avoid seedling injury

Buctril M or Curtail M adequate for general broadleaf weed control – Authority for full-season control of buckwheat & kochia

Where pasmo is present, Headline application will likely pay for itself & can greatly improve yields when disease pressure is high

Higher N rates? Seed treatments? Plant Growth Regulators?
Winter Wheat in a Challenging Year
What worked and what didn’t?
2013 Winter Wheat Trials

1) Seed Treatments & Seeding Rates (DU)

2) N Form, Placement & Timing (ADOPT)

3) Foliar Fungicide Applications (DU)
Treatments:
1) Unt – 200* seeds m\(^{-2}\)
2) Unt – 400 seeds m\(^{-2}\)
3) Trt ** – 200 seeds m\(^{-2}\)
4) Trt – 400 seeds m\(^{-2}\)

* 60-120 lb/ac seeding rates
** Raxil Pro (325 ml/100kg)
- Tebuconazole (1 gai/100kg), prothioconazole (5 gai/100kg) and metalaxyl (4 gai/100kg)
June 12, 2013

Raxil Pro Treated (left) vs Untreated (right)
200 seeds/m²
June 12, 2013

Untreated (left) vs Raxil Pro Treated (right)
400 seeds/m²
Seed Treatment & Rates

Main Effects – Emergence

Seed Treatment

- UNT
- TRT

Seedling Rate

- 175
- 225
- 275
- 325
- 375
- 425

P < 0.001

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Seed Treatment & Rates

Interactions – Emergence

\[ P = 0.019 \text{ (trt x rate)} \]

UNT  TRT

Seeding Rate (plants m\(^{-2}\))
Seed Treatment & Rates

Main Effects – Yield

Seed Treatment

- UNT: Yield (bu/ac) - P = 0.004
- TRT: Yield (bu/ac) - P = 0.002

Seedling Rate

- Seeds/m²
- 175, 225, 275, 325, 375, 425

P = 0.004
P = 0.002

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Seed Treatment & Rates

Interactions – Test Weight

\[ P = 0.046 \text{ (trt x rate)} \]

UNT

TRT

\[ \text{Seeding Rate (seeds m}^{-2}\text{)} \]

\[ \text{lb/bu} \]
Nitrogen Fertility Options
Indian Head 2013

23 N fertilizer treatments where:

- 0, 75 or 115 kg N ha\(^{-1}\) rate
  - Soil test N recommendation was 99 kg N ha\(^{-1}\)
- Untreated urea, ESN®, Nutrisphere-N® or liquid UAN as N fertilizer source
- N fertilizer either side-banded (at seeding), surface broadcast (early spring) or applied in a split-application (40/60)
Effects on Winter Wheat Yield

- 75N vs 115N
- FALL vs SPLIT
- SPR vs SPLIT

ns
ns
***
ns
***

bu/ac
0
10
20
30
40
50
60
70
80

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Nitrogen Fertilizer Forms Versus Untreated Urea (by timing)
Foliar Fungicide Demo
Indian Head, 2013

Treatments:
1) Check (no fungicide)
2) Twinline* (T1–flag)
3) Prosaro** (T2–head)
4) Dual (T1 + T2)

* Pyraclostrobin (65 gia/ha) + metconazole (40 gai/ha)
**Prothioconazole (100 gia/ha) + tebuconazole (100 gai/ha)
Foliar Fungicide Demo

Effects on Leaf Disease

Leaf Disease (0-12)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Leaf Disease</th>
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<tbody>
<tr>
<td>CHECK</td>
<td>10</td>
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<td>FLAG</td>
<td>8</td>
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<tr>
<td>HEAD</td>
<td>8</td>
</tr>
<tr>
<td>DUAL</td>
<td>6</td>
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</table>

Fungicide Treatment

P < 0.001

CHECK: a
FLAG: b
HEAD: b
DUAL: c
Foliar Fungicide Demo
Effects on Fusarium Head Blight

Fusarium Index (0-100)

- **FHB 1 (P = 0.100)**
- **FHB 2 (P = 0.005)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>FHB 1 (Mean ± SD)</th>
<th>FHB 2 (Mean ± SD)</th>
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<tbody>
<tr>
<td>CHECK</td>
<td>15.2 ± 2.1</td>
<td>16.0 ± 2.3</td>
</tr>
<tr>
<td>FLAG</td>
<td>18.0 ± 1.9</td>
<td>17.5 ± 1.8</td>
</tr>
<tr>
<td>HEAD</td>
<td>12.0 ± 1.5</td>
<td>11.0 ± 1.2</td>
</tr>
<tr>
<td>DUAL</td>
<td>8.0 ± 0.8</td>
<td>7.5 ± 0.7</td>
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Fungicide Treatment

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Foliar Fungicide Demo
Effects on Grain Yield

Grain Yield (bu/ac)

CHECK

FLAG

HEAD

DUAL

$P = 0.002$

Fungicide Treatment

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Foliar Fungicide Demo
Effects on Test Weight

$P = 0.024$

Fungicide Treatment

Test Weight (lb/bu)

CHECK

FLAG

HEAD

DUAL

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W. Wheat – Take Home Messages

- Winter wheat that does not emerge in the fall can still vernalize and produce high yields – assess stand establishment May 15-25 to give crop time to recover while still allowing reseeding if necessary
- Consider using seed-applied fungicide, particularly when seeding into very dry soils or potentially when seeding into cold soils
  - Significant benefits are less likely under optimal emergence conditions
- Applying entire N fertilizer requirements at planting still considered a risky practice in SE Saskatchewan but banding a some N can be beneficial particularly under dry conditions (split application)
  - Side-banded ESN blends or Super-Urea for spring broadcast possibly a good fit for winter cereals where potential losses can be high
- Foliar fungicides can effectively protect high yields when disease pressure is moderate to high
  - If leaf disease minor at flag-leaf stage, a single fungicide application at early heading will likely be most economical
Thank You!

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CROP MANAGEMENT FIELD DAY – July 22, 2014