

EFAO 2021: Research Protocol

Oat variety trial

Farmer-researcher(s): Norm Lamothe, Woodleigh Farms Ltd. - East

Project type: Variety trial

Research priorities: Seed selection, production and breeding

EFAO Contact: Sarah Hargreaves, sarah@efao.ca

Objective

Proper variety selection and timely management are necessary to raise a profitable oat crop. Norm will assess the performance of three different oat varieties in eastern Ontario.

Background

Background reports at:

<https://practicalfarmers.org/research/oat-variety-trial-2018/>

<https://practicalfarmers.org/research/oat-variety-trial-2019/>

<https://practicalfarmers.org/research/oat-variety-trial-2020/>

Experimental Design

Three replicate fields, approximately 10 acres each. There is a slope in each field, which is consistent across them. All three fields have been a two-crop rotation for 20+ years, such that this will be their first cereal crop. They field have had identical nutrient history and consistent fertility numbers. All varieties will receive the exact same seeding rates and management.

Norm will divide each field into thirds, and randomly assign one variety to each section as shown in Figure 1. Each $\frac{1}{3}$ section will align 60' wide sprayer passes, which will likely be 3x60' passes in field 1 and 2x60' passes in fields 2 and 3. Any excess in the headlands would not be factored into the plot areas. To harvest, Norm will use a ' 17.5' header, taking an average of 15' of harvestable crops on each pass, for ~ 12 passes per variety in Field 1 and ~ 8 passes per variety for fields 2 and 3. **He will record the harvest data for all passes individually.** Yield monitoring capabilities allow for incomplete header swaths to factor in yield as though a complete swath is taken.

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Statistical Model

Randomized complete block design with 3 replicates (8-12 pseudoreplicates for each pass) using a one-way ANOVA (analysis of variance).

Varieties & Field layout

Variety 1: Certified AAC Banner Oats - Treated Seed

Variety 2: Certified AAC Orford Oats - Treated Seed

Variety 3: Certified Bullet Oats - Treated Seed

Field 1 (F6), ~3 passes with sprayer and 12 passes with header per variety, 180' wide trial

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|--------------------|
| Variety 1 - Banner |
| Variety 3 - Bullet |
| Variety 2 - Orford |

Field 2 (F5), ~2 passes with sprayer and 8 passes with header per variety, 120' wide trial

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|--------------------|
| Variety 2 - Orford |
| Variety 1 - Banner |
| Variety 3 - Bullet |

Field 3 (F4), ~2 passes with sprayer and 8 passes with header per variety, 120' wide trial

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| Variety 3 - Bullet |
| Variety 2 - Orford |
| Variety 1 - Banner |

Measurements for each variety

Emergence, Stem Elongation and Heading

Norm will monitor emergence, timing of stem elongation and heading timing for replicate plot (9 measurements for each).

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Management differences

To keep the goals of the trial consistent, Norm will aim to manage all three varieties in the same way. He is hoping for consistent heading timing to ensure consistent fungicide application, but will manage these independently if necessary.

Yield

Norm will calibrate his combine monitor to record harvest of each pass automatically, to get yield numbers for each of the 9 replicate plots.

Profitability

Seed price

Normally seed price varies by variety; in the case of this trial, the seed cost was the same because of price discounts from Norm's suppliers.

Management

Timing of management decisions might vary by variety, based on growth stages if there are differences on maturity stages. Norm's goal is to extensively manage this crop to produce milling grade oats. In-season management will include herbicide if needed, as well as two applications of crop protection (leaf disease and head diseases targeted).

Inputs

Standard fertility across all varieties. Given Norm's current fertility maps for these fields, he will be applying 200lbs of K-Mag, 50 lbs of MAP, 50 lbs of Urea, 50lbs of Kcl pre-plant along with an additional 12 gals of UAN pre-plant with herbicide. (Norm to add total analysis here once we have all the calculations done).

Cover crop

Red clover will be broadcast across all varieties with dry fertilizer at planting.

Planting

Standard seeding rate across all varieties, goal of 1.0 mln seeds to the acres, using a drill with liquid starter fertilizer (5 gals of 5-20-5).

Price for drying based on harvest moisture

Will vary by replicate and variety.

Grading and sale price

Will vary by variety.

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Photos

Norm will take photos of each variety throughout the season.

Research Plan

| Time | Task | Methods & Measurements or Action Item |
|------------------------------|---|---|
| N/A | Field Prep | None. Previous crop soybeans, field clean coming out of two-pass program. |
| April 1 | Field Layout | Randomized order for test plot |
| April 1 | Fertilizer - Dry Cover Crop Underseed (double cut red clover) | Product: 200lbs K-Mag, 50 lbs MAP, 50 lbs KCl Actuals: 28-26-74-S=45-Mg=22 |
| April 4-5 (actual) | Fertilizer - Liquid Starter | Product: 5-20-5 @ 5 gals/ac with planting Actuals: 3-13-3 |
| April 4-5 (actual) | Planting | All on the same day Population: Estimated to be 1,000,000 seeds/ac for all varieties |
| Est. May 1 | Herbicide - if required | Product: Mextrol (does not harm clover) |
| Est. May 1 | Fertilizer - Liquid Nitrogen | Product: 28% UAN - Streamed, 12 gals UAN 8 gals water Actuals: 34-0-0 |
| Est May 15 | Fungicide & Foliar Fertilizer - T1 Timing, stem elongation | Product: Propiconazole + Vitazyme + MagSul |
| Est June 1 | Fungicide - 30-40% head emergence | Product: Tebuconazole - Add Calcium as a surfactant |
| Est July 30 | Harvest | Each pass/load measured independently |
| | Submit data and photos at each step of the process | Submit data and photos to Sarah at each step of the process |
| December 31, 2021 | Invoice | Send Sarah invoice for farmer-fee |

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*Please note that if data is submitted after the submission deadline, EFAO staff cannot guarantee that your data will be analyzed and written up before the Research Symposium and/or the next growing season.

Staff check-ins

Monthly via email

Materials

Please list all materials, supplies and equipment that will be reimbursed for this project. If possible, please also indicate a short-list of any in-kind materials, supplies and equipment that you will use.

| Material | Unit | Quantity Required | Total Cost* | Note |
|---------------------------------------|-----------------------------|-------------------|-------------|---|
| Seed | 2000 lbs AAC Bullet Oats | 1 | \$833.00 | \$980.00 less early order/pay discounts |
| Seed | 2000 lbs AAC Banner Oats | 1 | \$833.00 | \$980.00 less early order/pay discounts |
| Seed | 2000 lbs Orford Bullet Oats | 1 | \$833.00 | \$980.00 less early order/pay discounts |
| All planting and harvesting equipment | | | In-kind | |
| Total | | | ~ | \$2,940 with \$1,500 covered by farmer-led research program |

Acknowledgements

Joe Hickson - Midnight Acres, Lindsay, ON for providing his support (new seed varieties), knowledge and expertise.

Farmer-fee

\$500 in 2021, invoiced to EFAO after farmer-researcher submits data.

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Invoices for Farmer-Fees & Reimbursements

Research expenses

- Email an invoice along with copies of receipts for all qualified expenses to **research@efao.ca**.
- Expenses can be claimed anytime throughout the year.
- Deadline: December 31, 2021

Farmer-fee

- Email *an invoice for your farmer-fee* to **research@efao.ca**.
- Farmer-fees can be claimed after your data is submitted
- Deadline: December 31, 2021
- If you collect HST for your farm business, you can choose to add HST to your fee.

Memorandum of Understanding

You agree to keep an active membership with EFAO throughout the duration of your trial.

Signed and submitted.

To check the status of your membership, log in here:

<https://efao.z2systems.com/np/clients/efao/login.jsp> or contact Martina, martina@efao.ca.