

A green John Deere combine harvester is shown in a field of golden grain. The harvester has "BUCK FARMS MAPLETON, MAINE" and "MAINE MALT HOUSE" written on its side, along with the "JOHN DEERE" logo and the model number "635F". The background is a bright, hazy sky.

# Evaluating Alternative Malting Barley Varieties and their Acceptance in the Northeast Craft Brewing Community

**SARE Grant - FNE19-921**

Jacob Buck

Buck Farms/Maine Malt House

# Project Objectives

To determine if there are other barley varieties available that will perform better than, or equally to Newdale (our established regional malt variety) for the purpose of malting and brewing

Performance of varieties to be measure at three levels:

1. Field performance and harvested quality
2. Malting performance and malt quality
3. Brewing Performance and beer quality

# Planting

May 29<sup>th</sup> , 2019

Each variety was sown in the same field in 3 strips each with each strip containing roughly 3 acres. In total there were 9 strips (Tinka, Genie, Newdale, Tinka, Genie Newdale, etc) all following a 2018 crop of sunflowers.

A target population of 1.25 Million plants per acre was used and a stand loss of 10%. That gave us the following seeding rates:

- Newdale – 150 lbs/ac
- Genie – 137 lbs/ac
- Tinka – 168 lbs/ac

# Planting continued...

The grain drill was then calibrated for each variety by lifting the drive wheel and calculating revolutions/ac and weighing the seed from 6 chutes as a fraction of the total acre. Along with calibrating the seed from the chutes, we also calibrated the fertilizer dispenser for 340 lbs of 19-0-19 (65 lb of N) per acre.

The plots were planted using a GPS guidance system to eliminate overlap and better achieve the target population. All of the seed was treated with CruiserMaxx Vibrance Cereals prior to planting at a rate of 5oz/100 lbs. The final acreage for each variety was:

- Newdale – 9.2 acres
- Tinka – 9.0 acres
- Genie – 9.4 acres

# Pre-Harvest

- Post-Head Emergence
- 4 weeks prior to harvest
- Early indication of yeild

**Tinka**

**Newdale**

**Genie**



# Harvest

The Newdale and Tinka trials were harvested on August 27th and due to weather the Genie was harvest a few days later on August 31st. The combine used GPS to ensure that the plots were harvest as efficiently as possible. Each variety was scaled and the total weights and yields are as follows:

- Newdale – 36,180 lbs → 753.75 bu = 81.9 bu/ac (100.00%)
- Tinka – 40,820 lbs → 850.4 bu = 94.5 bu/ac (115.38%)
- Genie – 40,180 lbs → 837.1 bu = 89.1 bu/ac (108.79%)

# Barley Quality Specifications\*

	Newdale	Genie	Tinka
Moisture, %	13.2	14.0	14.1
Protein, % dry basis	10.5	9.5	9.4
Test Weight, lbs/bu	49.8	52.5	52.5
Plump, >6/64 %	96.4	98.8	99.1
Thin, <5/64 %	0.3	0.1	0.1
Germination Energy, 4 mL %	100	76	99
Germination Energy, 8 mL %	89	73	67
Germination Capacity, %	100	100	100
RVA	90	150	125
DON, ppm	<0.1	<0.1	<0.1

\*tested at Hartwick College: Center for Craft Food & Beverage

# Malting

- Each variety was run through our floor malting system under our “pale base two-row” recipe
- 4500 lbs of each variety was processed for malt and a similar 19-20% of malt loss was observed
- All varieties showed great water uptake in the steep cycle and great vigor on the floor. Genie performed more closely to Newdale, with Tinka lagging on the vigor throughout the 96 hour germination period.



# Malt Quality Analysis

	Newdale	Genie	Tinka
Moisture, %	6.0	4.8	4.9
Friability, %	89.6	90.6	95.6
Extract, FGDB %	82.9	85.1	83.3
Color, SRM	1.91	2.74	1.75
$\beta$ -glucan, mg/L	90	133	111
Soluble Protein, %	4.8	4.3	3.86
Total Protein, %	11.2	9.9	9.8
S/T	42.9	43.4	39.4
FAN, mg/L	180	180	145
Diastatic Power, L	139	93	97
Alpha Amylase, D.U.	75.7	52.5	56.0

\*tested at Hartwick College: Center for Craft Food & Beverage

# Overall Observations – Field and Malt House

Both varieties showed promising results in the field and malt house, but one year does not make a trend