**2022 American Malting Barley Association**

# Pilot-Scale Selection

**Selection:** DH150683  **Parentage:** 04-028-36/DH131772

**Project Leader:** Patrick Hayes (541) 740-5167, patrick.m.hayes@oregonstate.edu

**Description:**

 Growth Habit: Winter

 Spike Type: 2-row, Lax

 Awn Type: Rough

 Rachilla Hair: Short

 Aleurone Color: Bluish

 Glycosidic nitrile: Producer

**History**

DH150683 is a doubled haploid derived from the cross of 04-028-36/DH131772. 04-028-36 is an experimental German winter 2-row malting type. DH131772 is an experimental winter 2-row malting type from the OSU program. The cross was made in 2014 and the doubled haploid was produced in 2015. DH150683 was advanced through mini-plot, preliminary, and advanced yield trials in the Willamette Valley of Oregon based on agronomic and malting quality performance. It has progressed to regional and national trials. It was in the 2021-22 Winter Malting Barley Trial (WMBT) and Idaho Extension trials.

Data from Oregon environments are shown in Table 1. DH150683 has a 43 bu/acre yield advantage over the highest yielding check (Thunder). The test weight is excellent and 1.1 lbs/bu higher than the best check. DH150683 is earlier than any of the checks. DH150683 is three inches taller than the shortest check (Thunder) but has 10% less lodging. Stripe rust resistance is better than Endeavor and much better than Wintmalt and Thunder. The scald resistance is excellent compared to the checks.

In Idaho Extension trials (Table 2), DH150683 was 30 bu/acre lower in yield than Thunder and 9 bu/acre lower than Wintmalt. Test weight was lower than the checks (except Charles), but on-board test weight estimates tend to be lower than actual test weights. DH150683 is earlier than any of the checks. DH150683 is two inches shorter than the shortest check (Thunder) but had more lodging. Winter survival for DH150683 and the checks was 100%.

In terms of malting quality (Table 3), DH150683 has much better kernel plumpness than Endeavor and is better than Wintmalt and Thunder. The malt extract is 0.7% higher than the best check (Thunder) and within AMBA specifications for adjunct and all-malt. Barley proteins are optimal for DH150683 and the checks for both adjunct and all-malt. For S/T, only Wintmalt was approached specifications (for adjunct). DH150683 was over-modified, as were Endeavor and Thunder. DH150683 had higher DP than the checks and for this character fits the adjunct profile. The alpha amylase level was within specifications for adjunct; it was less than Thunder, comparable to Endeavor, and higher than Wintmalt. The wort beta glucan of DH150683 is within specifications and considerably lower than that of Endeavor. The FAN is high, and comparable to that of Thunder.

As shown in Table 4, DH150683 was rated satisfactory in its first year of AMBA Pilot testing (2021 crop).

DH150683 may have resistance to pre-harvest sprouting (PHS), based on one year of field data (2019). It had an RVA of 186 compared to PHS-susceptible Endeavor (5) and PHS-resistant Wintmalt (79). As shown in Table 5, DH150683 has a similar germination index to Thunder and a potential for water sensitivity comparable to the checks (e.g. low in 2021 and high in 2022).

DH150683 is not an epiheterodendrin (EPH) null - based on molecular marker data - and is therefore expected to be a producer of glycosidic nitrile (GN). The level of GN production has not been characterized.

**Agronomic Strengths**

High yield, excellent kernel plumpness, good lodging resistance, resistance to stripe rust and scald.

**Adaptation and Probable Production Area**

DH150683 was bred for fall-planting in the Pacific Northwest (South Idaho, Palouse, Columbia Basin, and western valleys of Oregon and Washington). Performance in South Idaho will be assessed in the Idaho Extension trials and the WMBT data will show if it has broader adaptation.

**Agronomic Characteristics**

**Table 1.** Agronomic performance of fall planted DH150683 compared to check cultivars. Average of 2017-2022 trials in Oregon.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Entry  | Yield (bu/acre) | Test Weight(lbs/bu) | Heading Date (DOY) | Plant height (in) | Lodging (%) | Stripe rust (%) | Scald (%) |
| *Station yrs.*  | 10 | 11 | 6 | 11 | 11 | 9 | 11 |
| DH150683 | 160 | 52.8 | 114 | 42 | 17 | 0 | 1 |
| Endeavor | 112 | 51.7 | 116 | 40 | 30 | 3 | 55 |
| Wintmalt  | 114 | 50.7 | 124 | 39 | 20 | 13 | 36 |
| Thunder | 117 | 51.4 | 117 | 39 | 27 | 13 | 39 |

**Table 2.** Agronomic performance of fall planted DH150683 compared to check cultivars. Average of the 2022 University of Idaho Extension Trials (Aberdeen and Rupert).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Entry | Yield(bu/acre) | Test weight\* (lbs/bu) | Heading (DOY) | Plant height(in) | Lodging (%) | Spring Stand(%) |
| *Station yrs.* | *2* | *2* | *2* | *2* | *2* | *2* |
| DH150683 | 160 | 48.0 | 149 | 38 | 51 | 100 |
| Endeavor | 155 | 49.2 | 154 | 43 | 32 | 100 |
| Wintmalt | 169 | 48.3 | 154 | 40 | 7 | 100 |
| Thunder | 190 | 50.7 | 152 | 40 | 24 | 100 |
| Charles | 156 | 45.8 | 153 | 41 | 67 | 100 |

**\***\*Test weight as measured by the on-board combine weighing system.

**Malting Quality Characteristics**

**Table 3**. Malt quality1 of DH150683 and check cultivars using data from analyses of barley samples grown in Oregon (2017-2021).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Entry | Plump Kernels (%) | Malt Extract (%) | Barley protein (%) | Wort protein (%) | S/T(%) | DP(0ASBC) | Alpha amylase(20°DU) | Beta glucan(ppm) | FAN(ppm) |
| *Station yrs.* | *9* | *9* | *9* | *9* | *9* | *9* | *9* | *9* | *9* |
| DH150683 | 98.0 | 83.4 | 10.7 | 5.5 | 54.8 | 186 | 90 | 61 | 276 |
| Endeavor | 88.7 | 82.3 | 10.2 | 5.2 | 54.8 | 145 | 93 | 201 | 236 |
| Wintmalt | 94.8 | 81.4 | 10.2 | 4.5 | 47.6 | 138 | 65 | 73 | 177 |
| Thunder | 96.0 | 82.7 | 10.6 | 5.6 | 57.5 | 159 | 119 | 71 | 279 |

1Data courtesy of the USDA-ARS Cereal Crops Research Unit, Madison, WI.

**Table 4.** Table extracted from the AMBA 2021 Crop Pilot Program



**Table 5.** Germination index (IK) and Water Sensitivity (WS) of DH150683 and checks at Lebanon (LEB) and Corvallis (COR), 2021 & 2022 crop. Data recorded in December 2021 & September 2022 of their respective harvest year.

