**2022 American Malting Barley Association**

# Pilot-Scale Selection

**Selection:** DH141917  **Parentage:** 04-028-36/Thunder

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**Description:**

 Growth Habit: Winter

 Spike Type: 2-row, Lax

 Awn Type: Rough

 Rachilla Hair: Long

 Aleurone Color: Blue

 Glycosidic nitrile: Producer

**History**

DH141917 is a doubled haploid derived from the cross of 04-028-36/Thunder. 04-028-36 is an experimental German winter 2-row malting type. Thunder is an AMBA-recommend winter 2-row malting variety from the OSU program. The cross was made in 2013 and the doubled haploid was produced in 2014. DH141917 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.

Available agronomic data from Oregon environments are shown in Table 1. DH141917 has a 22 bu/acre yield advantage over Thunder, the highest yielding check. The test weight is excellent and 1 lb/bu higher than the best check. DH141917 is later than Thunder and Endeavor and three days earlier than Wintmalt. The selection is two inches taller than the shortest check (Thunder) but has 10% less lodging. Stripe rust resistance is similar to Endeavor and much better than Wintmalt and Thunder. The scald resistance is excellent compared to the checks.

In the Idaho Extension trials (Table 2), DH141917 was higher yielding than all checks, except Thunder, which had a 4 bu/acre yield advantage. The test weights provided by Idaho Extension are not final – combine weights are onsite estimates. Based on these data, DH141917 is 1 lb/bu lower in test weight than Thunder but equal or better than the other checks. Heading dates are similar, with DH141917 two days later than Thunder. Plant heights are similar, but DH141917 has lower lodging than the other checks, except Wintmalt. All varieties/selections had 100% winter survival.

In terms of malting quality (Table 3), DH141917 has much better kernel plumpness than Endeavor and is better than Wintmalt and Thunder. The malt extract is comparable to the checks and better than Wintmalt and within AMBA specifications for adjunct and all-malt. Barley proteins are optimal for DH141917 and the checks for both adjunct and all-malt. For S/T, DH141917 was similar to Wintmalt and not as overmodified as Endeavor and Thunder. DH141917 had DP comparable to the Thunder check and for this character fits the adjunct profile. The alpha amylase level was within specifications for adjunct and all-malt; it was lower than any of the checks. The wort beta glucan of DH141917 is within specifications and considerably lower than that of Endeavor. The FAN is slightly higher than Wintmalt but lower than Thunder and Endeavor, fitting at the cusp of all-malt and adjunct profiles.

DH141917 was rated satisfactory in the AMBA Pilot program (2021 crop; Table 4).

DH141917 may have resistance to pre-harvest sprouting (PHS), based on one year of field data (2019). It had an RVA of 170 compared to PHS-susceptible Endeavor (5) and PHS-resistant Wintmalt (79). Lebanon and Corvallis, OR 2021 and 2022 crop data (Table 5) show DH141917 with a similar germination index to Wintmalt, 6.3 and 6.5 respectively in 2021 and water sensitivity comparable to checks in 2022.

DH141917 is not an epiheterodendrin (EPH) null and is therefore expected to be a producer of glycosidic nitrile (GN).

**Agronomic Strengths**

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

**Adaptation and Probable Production Area**

DH141917 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 DH141917 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 |
| DH141917 | 139 | 52.7 | 121 | 41 | 17 | 4 | 6 |
| 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 DH141917 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* |
| DH141917 | 186 | 49.1 | 154 | 41 | 10 | 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 DH141917 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* |
| DH141917 | 98.5 | 82.6 | 10.9 | 5.1 | 49.3 | 161 | 54 | 73 | 205 |
| 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 DH141917 and checks at Lebanon (LEB) and Corvallis (COR), 2021 & 2022 crop. Data recorded in December 2021 & September 2022 of their respective harvest year.

