**UNITED STATES DEPARTMENT OF AGRICULTURE**

**AGRICULTURAL RESEARCH SERVICE**

**In cooperation with**

**STATE AGRICULTURAL EXPERIMENT STATIONS**

**Report on Hard Red Spring Wheat Varieties Grown in Cooperative Plot and**

**Nursery Experiments in the Spring Wheat Region in 2021**

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Midwest Area

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**2021 HARD RED SPRING WHEAT UNIFORM REGIONAL NURSERY REPORT**

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**COOPERATING AGENCIES, STATIONS, AND PERSONNEL FOR THE 2021 HRSWURN**

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**Entering Lines with Protected or Patented Genes into the Hard Red Spring Wheat Uniform Regional Nursery**

Transgenic wheat lines may be considered for the nursery program ONLY if they have been granted permanent non-regulated status. Non-regulated status is granted only after the originator files a formal petition to de-regulate a line with APHIS. However, ultimately the decision whether to include or exclude such germplasm will reside with individual location cooperators.

**U.S. SPRING WHEAT PRODUCTION, 2021**

***SPRING WHEAT (OTHER THAN DURUM)*: Growers produced an estimated 331 million bushels of spring wheat. This production estimate is 43.6 percent lower than year 2020 production. Yield averaged 32.6 bushels per acre, a decrease of 16 bushels per acre from year 2020. Acres harvested totaled 10.1 million acres, which is approximately 16 percent lower than the acreage harvested in 2020.**

**Spring Wheat Production Statistics, 2019-2021\***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Acres Harvested (x1000) | | |  | Production (x1000 Bushels) | | |  | Yield (Bushels/Acre) | | |
|  | 2019 | 2020 | 2021 |  | 2019 | 2020 | 2021 |  | 2019 | 2020 | 2021 |
| Minnesota | 1,400 | 1,360 | 1,160 |  | 79,800 | 72,080 | 55,680 |  | 57 | 53 | 48 |
| Montana | 2,730 | 3,310 | 2,180 |  | 101,010 | 125,780 | 37,060 |  | 37 | 38 | 17 |
| North Dakota | 5,950 | 5,630 | 5,210 |  | 291,550 | 275,870 | 174,535 |  | 49 | 49 | 33.5 |
| South Dakota | 590 | 755 | 590 |  | 25,370 | 35,485 | 17,110 |  | 43 | 47 | 29 |
| USA | 11,625 | 12,095 | 10,165 |  | 561,095 | 587,505 | 331,140 |  | 48.3 | 48.6 | 32.6 |

\* Source: National Agricultural Statistics Service: (https://quickstats.nass.usda.gov) as of 1-3-22.

**2021 NURSERY DESCRIPTION AND SUMMARY**

The Hard Red Spring Wheat Uniform Regional Nursery (HRSWURN) was planted for the 91st year in 2021. The nursery contained 22 entries submitted by 5 different scientific or industry breeding programs, and 6 checks (Table 1). Trials were conducted as randomized complete blocks with three replicates except where noted. The HRSWURN was planted at 14 locations in 4 different states in the USA (MN, ND, SD, MT). Twelve locations provided data included in this report (Figure 1, Table 2), two locations were dropped due to extreme drought. Data summaries for each of the reporting locations are presented in individual tables. Overall means across locations for a set of core traits are summarized in Table 15, and yield rankings for individual locations are found in Table 16. Entries were also evaluated for various diseases at different locations; these can be found by looking at individual location data summaries. Leaf rust and stem rust resistance was evaluated in St. Paul, MN. These results are presented in Tables 17-18. Entries were evaluated for Fusarium head blight at St. Paul and Crookston, MN; these results are provided in Tables 19 and 20, respectively. Molecular marker genotyping for select agronomic, quality and disease resistance traits was also performed; this information is presented in Table 21. The highest average yielding location was Casselton, ND, with 100.7 Bu/Ac, while the lowest yielding location was Williston, ND, with 15.9 Bu/Ac.

**Figure 1. Hard Red Spring Wheat Uniform Regional Performance Nursery Locations, 2021**

