

HARD SPRING WHEAT QUICK FACTS

2020 Spring Wheat Facts

(National Agricultural Statistics Service-Idaho
<https://quickstats.nass.usda.gov/results/6E8A49B7-5547-3EE5-A456-590B197EF9F5>)

- Harvested Area: 495,000 acres
- Average Yield: 91 bu/A
- Production: 45,045,000 bu (60 lb = 1 bu)

Growth and Development

Using Feekes Growth Scale: Vegetative stage is through Feekes 5, reproductive stage begins at 6.

- **Germination** – when seed is exposed to adequate moisture, oxygen, and temperature
- **Seedling Growth** – until 9 or more leaves have unfolded
- **Tillering** – from 1 to 5 tillers
- **Stem Elongation** – starting from detection of first node
- **Booting** – flag leaf sheath extended to first visible awns
- **Inflorescence Emergence** – spikelet visible to complete emergence
- **Anthesis** – 5–7 days after heading, beginning to completion of flowering
- **Milk** – kernel development to late milk
- **Dough** – early (mealy), soft to hard dough
- **Ripening** – kernel approaches harvest moisture (hard dough to harvest ready)

Rotation and Seeding

- Wheat grows well in rotation—not recommended after corn or small grains when alternatives are available
- Good seed-to-soil contact is needed
- Seed depth should be 1–1.5 inches Row spacing of 6–8 inches with commercial drills provides uniform distribution of seed
- Seeding rate depends on seed size
 - » Irrigated: 1–1.2 million seeds/acre (65–120 lb/A)
 - » Dryland: 700,000 seeds/acre (55–90 lb/A)
- Optimum Germination — when soil temperature is between 55°F and 75°F

Table 1. Optimum planting date estimates.

Location	Timing
Treasure Valley	Late Feb to mid-March
Magic Valley	Mid-March to early April
Upper Snake River Plain	Late March to late April

Irrigation

- Timed to meet crop requirements
- Greatest yield reduction occurs with moisture stress at
 - » Tillering
 - » Boot to flowering

- Evapotranspiration (ET)
 - » ~ 15–19 inches of water
 - » Peak ET occurs in mid-June to mid-July and decreases after soft dough
- Water Holding Capacity (WHC): the amount of water held in soil for crops
 - » Soil texture WHC estimates
 - › Loamy > 2 in/ft
 - › Sandy loams 1–2 in/ft
 - › Sandy < 1 in/ft
- Available Soil Moisture (ASM) – the difference between existing soil moisture content and permanent wilting point
 - » ASM can be estimated by subtracting ET from the WHC if the soil profile WHC and soil moisture lost to ET are known
- Center Pivot Systems
 - » Early season – supply soil root zone with moisture
 - » Late season – pivot may not supply sufficient water to keep up with ET, in which case **additional soil water reserves will be needed**
- Surface Irrigation Systems
 - » Except on sandy soil – first irrigation should occur at 50% ASM
 - » At least 50% ASM maintained from tillering to soft dough

Fertilization

- Soil Sampling
 - » One to two weeks prior to planting
 - » 0–12-inch and 12–24-inch sample depth for nitrogen (N) separated by depth
 - » 0–12 inches for other nutrients
- Estimate of Nitrogen Rate – 2.5–3.5 units N/bu yield based on
 - » Inorganic soil test N
 - » Mineralizable N from OM = 30–60 N/A (estimated typically at 45 lb N/A)
 - » Crop residues
 - › Potato/sugar beet/onion residue is accounted for by soil test
 - › Alfalfa provides an additional 40–80 lb N/A not measured in early season soil tests
 - › Small grain residue—ADD 15 lb N for each ton of residue returned to soil (up to 50 lb N/A)
 - » Application timing
 - › Loamy soil – single preplant
 - › Sandy soil – split 40% preplant, 60% at tillering

Table 2. Pounds of P₂O₅ applied based on soil test and percent free lime.

Olsen Soil Test (0-12 in)	Percent free lime			
	0	5	10	15
ppm	lb P ₂ O ₅ /acre			
0	240	280	320	360
5	160	200	240	280
10	80	120	160	200
15	0	40	80	120
20	0	0	0	40

- » High-protein red spring wheat
 - › Topdress at flowering ~ 20–50 lb N/A for high-grain protein
 - › Depends on flag leaf N (4.2%–4.5% N ensures higher grain protein). Excellent early fertility may not require additional N.

Grain quality in hard wheat varieties is a function of N (response differs considerably among varieties) and S.

- Phosphorus (P, P₂O₅)
- Potassium (K, K₂O)
 - » Response can be expected in soil with <75 ppm K (0–12-inch sample)
- Sulfur (S, SO₄)
 - » 0–24-inch sample depth
 - » At < 10 ppm S (or <35 lb/A) and low-S irrigation water, add
 - › 20–40 lbs/A of sulfate-based fertilizer (can result in yield response)
 - › Target 10:1 to 5:1 N:S ratio
- Other Important Nutrients: Chloride, Iron, Manganese, Zinc, Copper, Boron

Growth Regulators

- Ethephon (Cerone) and/or Palisade

Apply at labeled rates and timing to reduce lodging and plant height

Common Diseases

- Stripe rust, Fusarium head blight (FHB), root rots (Fusarium crown rot, take-all, Rhizoctonia), cereal cyst nematodes, bacterial blight, loose smut, seedling blight (Pythium), and other nematodes

Common Insect Pests

- Aphids, cereal leaf beetle, Haanchen barley mealybug, thrips, wireworms, armyworms, and cutworms

Common Weeds

- Annuals: wild oat, green foxtail, kochia, common lambsquarters, redroot pigweed, feral rye, jointed goatgrass, wild buckwheat, and various mustards
- Perennials: Canada thistle, field bindweed, quackgrass

References

- Brown, B., and O. Walsh. 2016. *Planting Dates in Wheat Production in Southern Idaho*, University of Idaho Extension Bulletin 906.
- Brown, B., J. Stark, and D. Westermann. 2001. *Southern Idaho Fertilizer Guide: Irrigated Spring Wheat*, University of Idaho Extension CIS 828.
- Hagerty, C., and R. Smiley. 2017. *Field Guide for Diagnosing Common Wheat Maladies of the Pacific Northwest*, PNW 698.

About the Authors

J.M. Marshall—University of Idaho (UI) Research Professor, Extension Specialist (Plant Pathologist)

C.W. Rogers—Research Soil Scientist, Northwest Irrigation and Soils Research, Kimberly, ID

A. Rashed—UI Associate Professor, Ecological Entomology

X. Liang—UI Associate Professor, Cropping Systems Agronomy

O.S. Walsh—UI Associate Professor, Extension Specialist (Cropping Systems Agronomy)

A. Adjesiwor—UI Assistant Professor and Extension Specialist, Kimberly Research and Extension Center

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Barbara Petty, Director of University of Idaho Extension, University of Idaho, Moscow, Idaho 83844. The University of Idaho has a policy of nondiscrimination on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity/expression, age, disability or status as a Vietnam-era veteran.



BUL 986 |
Published December 2020
© 2020 by the University of Idaho