

# HARD WINTER WHEAT QUICK FACTS

## 2020 Winter Wheat Facts

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

- Harvested Area: 660,000 acres
- Average Yield: 101 bu/A
- Production: 66,660,000 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 under irrigation with good soil moisture
- Row spacing of 6–8 inches with commercial drills provides good distribution of seed
- Seeding rate depends on seed size
- Irrigated: 1–1.2 million seeds/acre (60–100 lb/A based on seed weight)
- Dryland: 700,000 seeds/acre (50–85 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 Oct to mid-Nov
Magic Valley	Mid-Oct to early Nov
Upper Snake River Plain	Late Sept to late Oct

## Irrigation

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

- Evapotranspiration (ET)
  - » ~ 15–19 in 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 will not supply sufficient water to keep up with ET, in which case **additional soil water reserves will be needed**
- Surface Systems (Irrigation)
  - » 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) and sulfur (S) 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 lbs N/A (estimated typically 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 or 40% preplant, 60% at tillering

**Table 2.** Pounds of P<sub>2</sub>O<sub>5</sub> applied based on soil test and percent free lime.

Olsen Soil Test (0-12 in)	Percent free lime			
	0	5	10	15
ppm	lb P2O5/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

- › Sandy soil—split 40% preplant, 60% at tillering

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

- 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 (or < 35 lb/A) and low-sulfur irrigation water
    - › 20–40 lbs/A of sulfate-based fertilizer can result in yield response
    - › Target 10:1–5:1 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, plant height

## Common Diseases

- Stripe rust, root rots (take-all, Fusarium crown rot, eyespot, Rhizoctonia), smut (loose, common, and dwarf smut), bacterial blight, WSMV and barley yellow dwarf, nematodes

## Common Insect Pests

- Aphids, cereal leaf beetle, thrips, wireworms, armyworms, and cutworms

## Common Weeds

- Annuals: wild oat, green foxtail, kochia, common lambsquarters, redroot pigweed, feral rye, jointed goatgrass, wild buckwheat, downy brome (cheatgrass), Russian thistle, mustards
- Perennials: Canada thistle, field bindweed, quackgrass

## References

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