

Winter Wheat Facts (NASS-ID)

- Harvested Area
 - 2020 – 660,000 acres
- Yield
 - 2020 – 101 bu/A
- Production
 - 2020 – 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 temp.
- Seedling growth – until 9 or more leaves have unfolded
- Tillering – from 1 to 5 tillers
- Stem elongation – Starting from detection of 1st node
- Booting – flag leaf sheath extended to first visible awns
- Inflorescence emergence – spikelet visible to complete emergence
- Anthesis – 5 to 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 to 1.5 in under irrigation and good soil moisture
 - Row-spacing of 6 to 8 in with commercial drills provides good distribution of seed
 - Seeding Rate* depends on seed size
 - Irrigated: 1 – 1.2 million seeds per acre (60 to 100 lb/A based on seed weight)
 - Dryland: 700,000 seeds per acre (50 to 85 lb/A)
- *Increased seeding rates recommended with delayed planting or poor seed bed.

Optimum germination - when soil temperature is between 55 and 75°F

Optimum Planting Date Estimates

<u>Location</u>	<u>Timing</u>
Treasure Valley	Late Oct to mid-Nov
Magic Valley	Mid-Oct to early Nov
Upper Snake River Plain	Late Sept to early Oct

Irrigation

- Time to meet ET, season crop needs

- Greatest yield reduction occurs with moisture stress at:
 - Tillering
 - Boot to flowering
- Evapotranspiration (ET)
 - ~ 15 to 19 in of water
 - Peak ET occurs in late May mid-June at heading 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 to 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 Irrigation Systems
 - 1st irrigation should occur at 50% ASM (earlier on sandy soils)
 - At least 50% ASM maintained from tillering to soft dough

Fertilization

- Soil Sampling
- One to two weeks prior to planting
- 0- to 12 in and 12- to 24 in sample depth for nitrogen (N) and sulfur (S) separated by depth
- 0- to 12 in 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 at 45 lb N/A)
 - Crop residues
 - Potato/sugarbeet/onion residue is accounted for by soil test
 - Alfalfa provides an additional 40 to 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
 - Sandy soil – split 40% preplant, 60% at tillering

Grain quality in hard wheat varieties is a function of Nitrogen (response varies among varieties) and Sulfur availability.

- Phosphorus (P, P₂O₅) - pounds of P₂O₅ applied based on soil test and percent free lime.

<u>Olsen Soil Test (0-12 in)</u>	<u>Percent free lime</u>			
	0	5	10	15
ppm	lbs 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

- Potassium (K, K₂O)
 - Response can be expected in soil with <75 ppm K (0-12 in sample)
- Sulfur (S, SO₄)
 - 0- to 24 in sample depth
 - At < 10 ppm (or <35 lb/A) and low-sulfur irrigation water
 - 20 to 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 (Cl), Fe, Mn, Fe, Zn, Cu, B

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, 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

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References:

Brown, B. 2001. Southern Idaho Fertilizer Guide: Irrigated Winter. University of Idaho AES CIS 373.
 Hagerty and Smiley. 2017. A Field Guide for Diagnosing Common Wheat Maladies of the PNW. PNW 698.
 NASS – National Ag Statistics, Idaho
 Robertson, Guy, Brown. 2004 Southern Idaho Dryland Wheat Production Guide UI AES BUL 827