CIS 1217

2023 Idaho Barley Crop
Harvest: 540,000 acres **Yield:** 112.0 bu/acre
Production: 60.5 million bu

University of Idaho Extension

2023 Southern Idaho

SPRING BARLEY QUICK FACTS

Growth Stages and Development

Table 1. Spring barley growth stages and development.

Stage	Feekes scale	Description
Tillering	1	First leaf through coleoptile
	2	Beginning of tillering
	3	Tillers formed
	4	Beginning of erect growth
	5	Sheaths strongly erect
Stem Extension and Booting	6	First node detectable
	7	Second node detectable
	8	Flag leaf just visible
	9	Collar of flag leaf visible
	10	Boot swollen/first awn visible
Heading	10.1	First spikelet visible
	10.2	Heading ¼ complete
	10.3	Heading ½ complete
	10.4	Heading ¾ complete
	10.5	Heading complete
Flowering (prior to head emergence)	10.51	Beginning of flowering
	10.52	Flowering ½ complete
Ripening	11.1	Medium milk
	11.2	Soft dough
	11.3	Kernel hard
	11.4	Harvest ripe

Rotation and Seeding

- Barley grows well in rotation but is not recommended after small grains or corn when alternatives are readily available due to disease pressures.
- Good seed-to-soil contact and moisture availability are needed.
- Seed depth: 1.0–1.5 inches.
- Row spacing: 6–8 inches is ideal.
- Seeding rate: approximately 800,000 seeds per acre is ideal. Actual seeding rate depends on seed size, purity, percentage germination, and seed viability.
  - » Irrigated: 70–100 lb/acre
  - » Dryland: 60–80 lb/acre
- Minimum soil temperature for germination: 40°F.
- Seed treatments can improve stand uniformity and protect the crop from pests, particularly under cold/wet conditions.

Table 2. Spring barley seeding date estimates.

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

Irrigation

- Drought stress prior to soft dough (Feekes 11.2) reduces yield.
- Yield reduction due to moisture stress is greatest at tillering and/or boot to flowering.
- Excessive moisture can cause lodging.
- Irrigate based on soil moisture depletion estimated by evapotranspiration (ET).
- ET: ~ 15–19 inches of water per season.
- Peak ET: mid-June to mid-July, decreasing after soft dough.
- Water-holding capacity (amount of water in soil for crop use):
  - » Loamy soils: more than 2 inches per foot
  - » Sandy loam soils: 1–2 inches per foot
  - » Sandy soils: less than 1 inch per foot
- Available soil moisture is water held between current soil moisture and the permanent wilting point.
- Center pivot systems
  - » Early season: Irrigate based on soil moisture reserves needed to meet mid- to late-season demands when the pivot cannot meet ET. Irrigate until the root zone is full or until water has penetrated 2.5–3 feet into the soil.
  - » Late season: Pivot will not supply sufficient water to keep up with ET; soil water reserves will be needed.
- Surface systems
  - » First irrigation should occur when soil moisture declines to 50% at the 0–6-inch depth except on sandy soils.
  - » Maintain soil moisture levels at or above 50% from tillering to soft dough.

Fertilization

Sampling

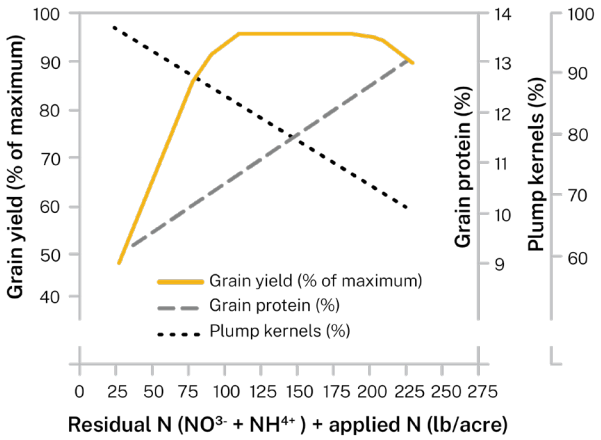
- Soil testing is required to determine optimal nutrient management strategies.
- Timing: 2 weeks prior to planting.
- Depth: to rooting depth (2 feet on most soils).
- Separate samples:
  - » 0–12-inch and 12–24-inch depth for testing ammonium, nitrate, and sulfur.
  - » 0–12-inch depth for other nutrients.

Nitrogen (N)

Fertilizer N needed = N needed based on potential yield + N needed for residue breakdown - Mineraliz-able N + Soil test N

- N needed based on potential yield estimate = lb N/bu × realistic potential yield estimate.
  - » Malt-irrigated: ~1.1–2.0 lb N/bu
  - » Feed-irrigated: ~1.7–2.3 lb N/bu
  - » Dryland: ~1.1–1.4 lb N/bu
- Crop residues
  - » Potato/sugar beet/onion residue provides N that is accounted for by soil testing.
  - » Grain residue has a higher C:N ratio; add 15 lb N per ton of residue returned to the soil, up to 50 lb N/acre.
  - » Alfalfa provides 60–80 lb N/acre beyond soil test levels.
- Mineralizable N
  - » Typically estimated at 45 lb N/acre.
  - » Conservative estimates range from 30 to 60 lb N/acre.
  - » Can exceed 100 lb N/acre at select locations
- Inorganic soil test N: Multiply ppm (parts per million) by 3.6 for lb N/acre.

Figure 1. Grain quality response in malting varieties as a function of N.



Phosphorus (P)

Table 3. Phosphorus fertilizer rates for soils with pH >7.

$NaHCO_3$ (0–12 inches)	Free Lime (%)			
	0	5	10	15
(ppm)	(lb P_2O_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)

- With soil test levels of 0–75 ppm K ($NaHCO_3$ extraction), apply 0–240 lb/acre K_2O.

Sulfur (S)

- With soil test levels (0–2 ') of less than 10 ppm S and low-sulfur irrigation water, apply 20–40 lb/acre of S.
- Irrigation water derived from the Snake River or Snake River aquifer can supply 30–70 lb S/acre foot of water.

Plant Growth Regulators

- Used to reduce the occurrence of lodging.
- Ethephon (e.g., Cerone): apply during Feekes 7–10.
- Trinexapac-ethyl (e.g., Palisade 2EC): apply during Feekes 4–7.
- See manufacturer's label for detailed guidelines/instructions.

Diseases

- Most common: scald, root rots, spot blotch, spot form of net blotch, bacterial blight, loose smut, and barley yellow dwarf virus.

Insects

- Most common: aphids, cereal leaf beetle, thrips, Haanchen barley mealybug, wireworms, armyworms, and cutworms.

Weeds

- Most common annual species: wild oat, green foxtail, kochia, common lambsquarters, redroot pigweed, wild buckwheat, and various mustards.
- Most common perennials: Canada thistle, field bindweed, and quack grass.

For more information

Soil Testing to Guide Fertilizer Management University of Idaho Extension Bulletin 915, https://www.uidaho.edu/extension/publications/bul/bul915

Soil-Testing Procedures for Southern Idaho Soils, University of Idaho Extension Bulletin 970 https://www.uidaho.edu/extension/publications/bul/bul970

Scheduling the Final Irrigation for Wheat and Barley, University of Idaho Extension Bulletin 912 https://www.uidaho.edu/extension/publications/publication-detail?id=bul0912

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