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

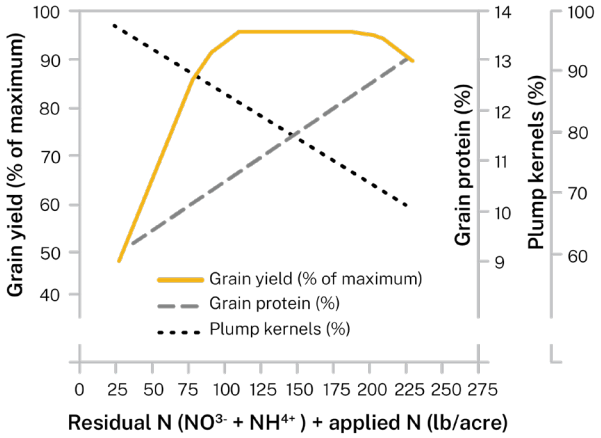
- Soil testing is required to determine optimal nutrient management strategies.
- Timing: 2 weeks prior to planting.
- Depth: to rooting depth (2 feet on most soils).
- Separate samples:
  - » 0–12-inch and 12–24-inch depth for testing ammonium, nitrate, and sulfur.
  - » 0–12-inch depth for other nutrients.

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

Authors

Jared A. Spackman, Idaho Barley Commission Endowed Barley Agronomist, University of Idaho Extension, Aberdeen Research and Extension Center

Christopher W. Rogers, Research Soil Scientist, United States Department of Agriculture-Agricultural Research Service, Kimberly, Idaho

Juliet M. Marshall, Cereal Cropping Systems Agronomist and Pathologist, University of Idaho Extension, Idaho Falls Research and Extension Center

Arash Rashed, Entomologist, Virginia Tech, Blacksburg, Virginia

Don W. Morishita, Extension Weed Specialist (retired), University of Idaho Extension, Kimberly Research and Extension Center

Albert Adjesiwor, Extension Weed Specialist, University of Idaho Extension, Kimberly Research and Extension Center

UI PEER REVIEWED

CIS 1217 | Published December 2023 | Revised December 2024