

The following fertilizer guidelines were developed through research conducted by the University of Idaho and Washington State University. The guidelines are based on relationships between soil test data and yields of winter barley. The suggested fertilizer rates are designed to produce above-average yields if other factors such as pests, soil moisture, planting date, and stand are not limiting production. Thus, the fertilizer guidelines assume the use of sound management practices.

The suggested fertilizer rates will be accurate for a given field provided (1) soil samples are properly taken and represent the area to be fertilized and (2) the crop history you supply is complete and accurate. For assistance in obtaining a good soil sample, refer to BUL 704, *Soil Sampling*.

Nitrogen needed for residue breakdown—

Nitrogen is needed to break down straw from the previous cereal crop. Apply 15 pounds available N for each ton of straw incorporated into the soil up to 50 pounds N per acre (Table 2). Remember, 1 ton of residue is produced for each 20 bushels of wheat or 1,400 pounds of barley grain produced.

Table 2. Nitrogen needed for cereal residue (lb/acre)

Residue (tons)	N needed (lb/acre)
0	0
0.5	7.5
1	15
2	30
3	45
4 or more	50

Note: One ton of residue is produced for each 20 bushels of wheat or 1,400 pounds of barley grain produced.

Nitrogen credit from previous legume crop—

If the previous crop was a legume (peas, chickpeas, alfalfa, clover, or lentils) the residue constitutes a nitrogen credit. This value, which can be obtained in Table 3, should be subtracted from the total N needed to produce the winter barley crop.

Table 3. Nitrogen credit from legume residue (lb/acre)

Residue (tons)	N credit (lb/acre)
0	0
0.5	8
1	15
1.5	23
2	30
3	45
4	60

Note: One ton of legume residue is produced from each 1,400 pounds of lentil or pea grain produced.

Mineralizable nitrogen—

Soils vary in their capacities to release N from organic matter during the growing season. The rate or amount of N released depends on factors such as the amount of soil organic matter, soil erosion, available soil moisture, tillage practice, and soil temperature during the growing season.

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Calculation for nitrogen fertilizer needed–

Total N needed (lb/acre) (Table 1 + Table 2)		_____
Minus N credit (lb/acre) (Table 3)	–	_____
Minus mineralizable N (lb/acre) (Table 4)	–	_____
Minus soil test N (lb/acre) (Table 5)	–	=====
Equals fertilizer N needed (lb/acre)	=	_____

Example: With an annual precipitation of 21 inches and a potential yield of 5,000 pounds per acre, 2.5 percent organic matter (conventional tillage), 1 ton legume straw residue, and soil test values from the example in Table 5, you would need 95 pounds N per acre:

Total N needed (Table 1 + Table 2)	(137 + 0)	195
Minus N credit (Table 3)	–	15
Minus mineralizable N (Table 4)	–	50
Minus soil test N (Table 5)	–	<u>35</u>
Equals fertilizer N needed	=	95*

*7 lb/acre more fertilizer N would be needed if this were a reduced tillage system.

Phosphorus

Winter barley has a relatively moderate phosphorus

**Table 8. Sufficiency of Evidence Based
on File.**

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