

# Washington State University Dryland Winter Wheat Nitrogen Needs Worksheet and Application Record\*

<b>Grower:</b>	<b>Rainfall zone:</b>	<b>Assisted by:</b>	
<b>Tract:</b>	<b>Crop class:</b>	<b>Field description:</b>	
<b>Date:</b>	<b>Soil type:</b>	<b>Field size:</b>	acres

<b>A N supply needed by the crop to meet yield and quality goals</b>		<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">(N supply needed)</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">-</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">(Soil N)</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">=</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">(lb N/acre to apply)</div>
1. Yield goal		
<input type="checkbox"/> Estimated based on grower practices and experience: _____ bu/ac <input type="checkbox"/> Estimated based on soil moisture + expected rainfall (in inches): (_____ soil moisture + _____ expected rainfall - 4) x _____ bu/inch <sup>1</sup> = _____ bu/ac <small><sup>1</sup>bushel yield per inch available moisture (bu/inch): soft white winter wheat = 7; all other winter wheat = 6</small>		
2. N supply needed _____ bu/acre (line A1 above) x _____ lbs N/bu <sup>2</sup> = _____ lb N/ac →→ <small><sup>2</sup> lbs of N per bushel yield: soft white winter and club = 2.7 +/- 0.2; hard red and hard white winter = 3.0 +/- 0.2</small>		
<b>B Soil N inventory</b>		
1. Current soil test N (nitrate + ammonium) (see text)	+ _____ lb/acre	-
2. Credit from previous legume crop (see text)	+ _____ lb/acre	
3. Credit from organic matter release (see text)	+ _____ lb/acre	
4. Debit for residue decomposition (see text)	- _____ lb/acre	
5. Other credit (source: _____)	+ _____ lb/acre	
6. Total soil N inventory (lines 1 through 5)	= _____ lb/acre →→	
<b>C N to apply (fertilizer recommendation)</b>		
1. Line A2 _____ - line B6 _____ = _____ lb N/acre →→		(lb N/acre to apply)

<b>D N application, yield, and protein record</b>				<b>E Post-harvest N efficiency calculation</b>	
Date	Form	Method	Rate (lb N/ac)	$\frac{\text{yield, bu/ac} \times \text{\% protein}}{\text{factor}^1} = \text{N uptake lb/ac}$	
				$\frac{\text{Total N applied (left)} + \text{Soil N inventory (line B6)}}{\text{N supply}} = \text{N supply lb/ac}$	
Total N applied (lb/acre):				$(\text{N uptake} \div \text{N supply}) \times 100 = \text{\% N uptake efficiency}$	
Yield: _____ bu/acre		Protein: _____ %		<small><sup>1</sup>Factor to convert yield from bu to lbs, % grain protein to %N, and grain N to whole-plant N. Use 0.15 for soft white and club; use 0.13 for hard red and hard white.</small>	
Notes:				$\frac{\text{lb/ac N supply}}{\text{yield, bu/ac}} = \text{lb N/bu}$	
				$\text{N supply} - \text{N uptake} = \text{lb N/ac}$	
				$\text{N supply} - \text{N uptake} = \text{lb N/ac}$	

\* Attach this form to the current soil test report and archive as part of the field record.