



## WHEAT LEAF ANALYSIS AND INTERPRETATIVE GUIDELINES

Laboratory analysis of wheat leaves is a very useful tool to evaluate the adequacy of nutrients required for wheat production. Analysis of wheat leaf samples from both dryland and irrigated fields can be done early enough in the spring to correct the deficiency of several nutrients, particularly nitrogen, sulfur, and zinc. Wheat leaf samples can also be analyzed later in the growing season and used to interpret the adequacy of the fertility program used for the current wheat crop.

Use the sampling process outlined as follows:

1. Stage of maturity
  - a. Samples collected at the early stage of maturity before the formation of the 2<sup>nd</sup> joint should include the whole plant clipped  $\frac{1}{2}$  to 1 inch above the soil surface. Do not include roots in the sample.
  - b. Samples collected at the later stage of maturity should include the upper 3 to 4 leaves prior to heading. Do not sample after the head has emerged.
2. Collect a small handful of whole plants or leaves at each collection site. Collect samples randomly from each 3 to 5 acre area in the field and composite them into one sample. Each sample should not represent more than 60 to 80 acres. Keep samples separate from areas of the field that are distinctly different.
3. Place the composite sample into a paper bag and send to Olsen's Lab. Do not put the samples in a Ziploc plastic bag to send to the lab.

Upon receiving the sample(s) at the lab, the sample will be processed and analyzed. Nitrogen test results will be available to the client the next working day after the sample is received. The remainder of the analytical results will be available to the client 2 to 3 days after receiving the sample.

Results can be returned to the client by the following ways, depending on the client's request:

1. Olsen's Laboratory Internet Client Software
2. Email
3. Regular mail delivery

Olsen's Laboratory interpretative guidelines for wheat samples collected at both stages of maturity are on the following page. Nutrient critical levels are used to diagnose wheat fertility problems. Please note that nitrogen fertilizer recommendations are suggested for wheat samples collected at the early stage of maturity.

**WHEAT**

Stage of Maturity:  
Whole plant prior to second joint.

<u>Nutrient</u>	<u>Critical Level</u>	<u>Low Range</u>	<u>Sufficient Range</u>
Nitrogen, %	4.00	4.00 – 4.20	4.20 – 5.00
Phosphorus, %	0.22	0.22 – 0.25	0.25 – 0.50
Potassium, %	1.60	1.60 – 2.00	2.00 – 3.00
Calcium, %	0.12	0.12 – 0.20	0.20 – 1.00
Magnesium, %	0.08	0.08 – 0.10	0.10 – 0.80
Sulfur, %	0.15	0.15 – 0.25	0.25 – 0.50
Iron, ppm	5	5 – 10	10 – 250
Manganese, ppm	10	10 – 20	20 – 100
Zinc, ppm	15	15 – 25	25 – 70
Copper, ppm	1	1 – 3	3 – 25
Boron, ppm	1	1 – 3	3 – 25

**NITROGEN RECOMMENDATIONS FOR WHEAT**

Stage of Maturity:  
Whole plant, excluding roots, prior to second joint.

<u>Total Nitrogen</u> %	<u>Yield Goal, bu/A</u>		
	<70	70 – 100	>100
<2.20	60	90	120
2.20 – 2.60	50	75	100
2.60 – 3.00	40	60	80
3.00 – 3.40	30	45	60
3.40 – 3.80	20	30	40
3.80 – 4.20	10	15	20
>4.20	0	0	0

**WHEAT**

Stage of Maturity:  
Three to four uppermost leaves prior to heading.

<u>Nutrient</u>	<u>Critical Level</u>	<u>Low Range</u>	<u>Sufficient Range</u>
Nitrogen, %	1.75	1.75 – 2.50	2.50 – 4.50
Phosphorus, %	0.20	0.20 – 0.25	0.25 – 0.50
Potassium, %	1.50	1.50 – 1.60	1.60 – 3.00
Calcium, %	0.10	0.10 – 0.15	0.15 – 1.00
Magnesium, %	0.08	0.08 – 0.10	0.10 – 0.80
Sulfur, %	0.12	0.12 – 0.15	0.15 – 0.50
Iron, ppm	5	5 – 10	10 – 250
Manganese, ppm	10	10 – 25	25 – 100
Zinc, ppm	10	10 – 15	15 – 70
Copper, ppm	1	1 – 2	2 – 25
Boron, ppm	1	1 – 2	2 – 25