

## Evaluation of 6-24-6 for Improving Yield and Quality of Hard Red Spring Wheat

Dr. Jeffrey Stark, Research Professor, Agronomy and Department Chair of Horticulture Science, University of Idaho

### Introduction:

Spring wheat requires nutrient availability throughout the growing season. Phosphorus (P) must be readily available for plant uptake, highly soluble, and avoid becoming tied up by soil cations.

### Challenge:

In many soils, especially calcareous grasslands (fields with high levels of calcium carbonate), P is quickly seized by soil cations and becomes unavailable for plant use. The results of delivery methods and rates for P must be studied in order to create nutrition programs that give plants optimal access to P while improving grain size and quality.

### Research:

Research professor Dr. Jeffrey Stark of the University of Idaho planted hard red spring wheat to determine the results of applying Simplot's 6-24-6. The study focused on effects of banding the nutrients preplanting or splitting applications between banding and foliar applications. Yield, protein content, dry matter production, and nutrient uptake were measured at harvest.

### Methodology:

"Cabernet" hard red spring wheat was planted in a sandy loam soil, in a randomized complete block design. Each treatment had five replications that compared banding and a combination of banding and foliar applications at several rates of application.

Sufficient nitrogen was delivered to the entire test area prior to planting to bring soil N to 140 lbs N/acre in accordance with University of Idaho guidelines. The control plot received no other fertilizer. The next three plots received a single banded treatment of Simplot's 6-24-6 in concentrations of 3.0, 6.0, and 9.0 gallons/acre (GPA) respectively. The final three plots received a banded treatment equal to half of the earlier treatments (1.5, 3.0, 4.5 GPA), then two separate foliar applications of 6-24-24 equal to half of the banded treatment (0.75, 1.5, and 2.25 GPA).

## Results:

A small plot combine harvested a 4'x30' section from the center of each plot. Samples were weighed and tested for protein content. Uptake of N, P, and K generally increased with treatment rate increases. The banded treatments generally showed slightly higher levels of plant nutrition than the split banded and foliar treatments. Banded treatments produced higher yields than the split treatments at 3 and 6 GPA. Grain protein content and dry weight generally increased with application rate, but had no significant differences due to application method.

## Practical Applications:

Application of 6-24-6 improved dry matter production and N, P, and K uptake. Overall, banded applications performed better than a split application of banded and foliar treatments. Foliar application of 6-24-6 increased nutrition uptake, but not grain yield.

**“Cabernet” spring wheat yield, dry matter production and N,P,K uptake as influenced by 6-24-6 application method, rate, and timing, at Aberdeen, Idaho, 2015.**

Total N	Total P	Total K	Preplant banded gal/acre	Split applied* foliar gal/acre	Plant Uptake**				Yield bu/A	Protein %	Test Weight lbs/bu
					Grams N/m <sup>2</sup>	Grams P/m <sup>2</sup>	Grams K/m <sup>2</sup>	DM lbs/A			
----- lbs/acre -----											
0	0	0	0	0	22.7	5.1	5.0	6,008	102.1	13.8	56.3
6	8	6	3	0	27.0	5.2	5.3	6,431	116.5	14.3	60.4
11	16	11	6	0	36.9	6.2	5.7	7,310	117.5	14.8	60.5
17	24	17	9	0	33.1	7.5	6.2	7,319	116.4	14.7	60.7
6	8	6	1.5	1.5*	24.8	5.5	5.2	5,658	107.5	14.5	60.5
11	16	11	3.0	3.0*	29.0	6.0	5.8	6,697	109.3	14.9	60.5
17	24	17	4.5	4.5*	36.8	7.2	6.7	8,099	112.2	14.6	61.1
<b>Means</b>					30.6	6.1	5.7	6,789.2	111.6	15.0	60.0
<b>Pr &gt; F</b>					0.022	0.035	0.049	0.021	0.057	0.047	0.029
<b>LSD@0.10</b>					3.1	0.6	0.6	438	6.2	0.4	2.3

\*Foliar applications made on June 3 and June 14.

\*\* Whole plant samples harvested August 4.