

Wheat/Small Grains Approach and Budget

We can approach regenerative wheat or small grains crop nutrition in a number of ways, from individual applications to a full, customized nutritional program. Each application below is a part of a comprehensive approach, and each may be used as a standalone treatment. They are arranged, in order from the top, by greatest return on investment and ease of implementation, not according to seasonal timing. Estimated costs per acre are based on an average 80 acre field.

1. **BioCoat Gold Mycorrhizal Seed Coat: \$11-15 per acre** (depending on seed size and planting population).

The most cost-effective step into regenerative agriculture is to use our dry seed inoculant **BioCoat Gold**. In addition to assisting early germination, seedling vigor, and root development, BioCoat Gold contributes to greater nutrient uptake and drought resistance and is the easiest way to establish beneficial bacterial and fungal species throughout your fields while you are planting seeds. There is no additional equipment needed; simply mix the BioCoat Gold powder dry onto seeds before planting. BioCoat can still be used to good effect on seeds treated with fungicides. Use about 6 oz per 100 lbs of seed for wheat.

2. **Regenerative Soil Primer: \$45-60 per acre**

For winter wheat, the most effective step toward fertilizer reduction and long-term soil regeneration is to start in the fall with the **Regenerative Soil Primer**. This builds soil by increasing microbial digestion, building long-chain carbon structures, sequestering nitrogen, and recycling nutrients such as phosphorus and essential micronutrients; all this can lead to a decrease in your input costs for subsequent seasons. The suggested rate is 4-6 quart of **Rejuvenate** and 2-3 quart of **SeaShield**, along with 50 gram of **Spectrum** per acre. In arid climates, use **Spectrum DS**.

3. **Nitrogen Efficiency Program** is calculated according to this formula:

- X= total amount of nitrogen product, not units of N
- Maintain 10:1 nitrogen to sulfur ratio
- 1 pint **Rebound Molybdenum** (per acre)
- 3% of X as **Humacarb**
- 3% of X as **Rejuvenate** (optional)
- If Regenerative Soil Primer was not applied in the fall, add 25 grams of Spectrum

The **Nitrogen Efficiency Application** makes best use of one of your largest and most expensive inputs. It complexes N with soil biology and the right mineral balance to provide slow release according to crop demand. This can reduce the dependency and cost of synthetic nitrogen inputs while still allowing biology its best chance for symbiotic function with plant roots. While it is not realistic to make universal recommendations given the wide variability in soils, crops, and management practices, we do commonly observe that

many growers are able to reduce nitrogen application rates by 30%-50% from typical recommendations in the first year and produce the same or higher yields, compared to controls. This calculation works in the majority of situations, yet the specific application rates may vary according to need.

In the majority of sap tests we have seen, wheat rarely needs supplemental nitrogen prior to tillering. Generally speaking (and depending on cover crop residues, moisture, etc), moving the majority of your N from a preplant application to later in the season, preferably in multiple smaller applications, as needed, is a key part of any N efficiency and plant health program. Use sap analysis to diagnose precisely whether the crop has adequate N.

On some farms, steps 1 through 3 are sufficient to grow a high-yielding crop.

4. Sap analysis: \$95 per set

Upon seeing actual nutrient levels in plant sap analysis, growers gain the confidence to make calculated changes in their fertility program. Taking the first sap sample shortly after tillering provides an early look at nutrient status. One or two more samples taken later in the season allow nutritional fine-tuning at flag leaf and grain fill. Use of sap analysis identifies greatest limiting factors and guides foliar spray of nutrients and Nitrogen side-dress. We cannot know exactly what nutrients will be needed until sap analysis is performed, but AEA has a historically informed set of recommendations that we employ for early season application before sap testing is available.

5. Flag Leaf Foliar: \$29-35 per acre

Based on sap analysis and/or other crop quality metrics, this application is made around flag leaf, prior to heading. It provides reproductive minerals that emphasize pollination and eventual grain size, while also keeping photosynthesis adequate. This will generally contain the following, though any mineral in short supply may be addressed at this time based on results of sap analysis.

- 3-4 quart **Accelerate**
- 1 quart **Photomag**
- 1 quart **Micropak**
- 1 pint **Copper**
- 1 pint **Rebound Iron** (if needed)

6. Green-up foliar: \$34-38 per acre

This foliar spray application provides support for emerging or over-wintered plants before the season's first sap analysis can be done. These products help plants to create photosynthetic efficiency promoting the natural mineral release of the **Rhizophagy Cycle**. This is most necessary in fields with low mineral availability or stressed young plants.

- Only 5-10 pounds of N
- 2 quart **Photomag**
- 1-2 quart **Rejuvenate**
- 2 quart **Accelerate**
- 10 gram of **Spectrum** (25 grams or higher if no Soil Primer)

7. **Grain fill foliar: \$21 -39 per acre**

The focus with this final application is on using micronutrients to maximize plant immunity and address the greatest limiting nutrient factors that affect protein levels and kernel test weight. Potassium may be needed if the crop has a heavy grain set. The products most often needed are as follows, but, as always, testing with sap analysis unleashes the full potential of the AEA approach.

- 2 quart **PhotoMag**
- 2 quart **MicroPak**
- 1 quart **Rebound Boron**
- **Holo-K** as needed

We understand that decisions are often compelled by the budgeting considerations between this year's crop and long-term soil-building. Because most markets do not reward increased quality and conventional commodity prices are beyond growers' control, the cost of our wheat program averages under \$110 an acre. Where the grower stands to benefit from organic or food-grade premiums, future soil health, and wheat nutrient content, even more gains can be achieved. Suitability on your operation depends on when during the season you start working with us, equipment availability, and your goals.