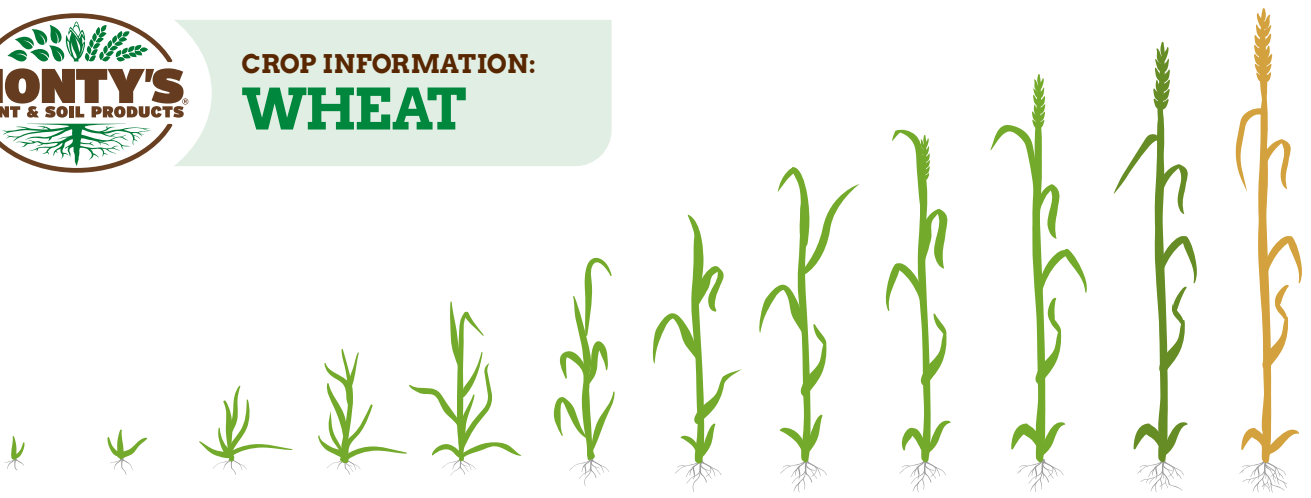




## CROP INFORMATION: WHEAT



**FEEKES**    **1**    **2**    **3**    **4 - 6**    **8**    **9**    **10**    **10.1 - 10.5**    **11**

WHEAT	Pre-Plant Planting	Feekes 2-3 Tillering	Feekes 4-5 Breaking Dormancy	Feekes 9 Jointing Before Flag Leaf	Feekes 10-10.5 Boot-Heading/Flowering	Post-Harvest
Monty's Recommended Program	MLC: 2-4 qt/ac Agri-Sweet FG: 1-2 qt/ac Nauxin* /Microhance: 1-2 qt/ac	Nauxin* /Microhance: 1-2 qt/ac Surge XD: 1 qt/ac Agri-N: 2-4 qt/ac Sulfur 15: 1-2 qt/ac	1st N application: MLC: 1 qt/ac Agri-Sweet FG: 1 qt/ac	2nd N application: MLC: 1 qt/ac Agri-Sweet FG: 1 qt/ac	Nauxin*: 1-2 qt/ac Surge XD: 1 qt/ac Agri-N: 2-4 qt/ac Sulfur 15: 1-2 qt/ac K28: 1-2 qt/ac	Humi-Till/ Break-down: 1 gal/a Agri-Sweet FG: 1-2 qt/a
Monty's Program Benefits	Improves soil health and stimulates soil microbial populations	Maximizes yield and increases protein content	May increase uptake of N application, buffer salts and pH		Maximizes yield	Residue management soil for next Spring Decreases soil compaction Increases soil microbial populations
Fertility Needs	N, P, K		N	N		
Maintenance Applications		In addition to each Nitrogen application, add: MLC: 1-2 qt/ac, Humihance: 0.5 gal/1 ton dry fertilizer, Surge XD: 1-2 qt/a: Can be added to any herbicide/pesticide/fungicide application. Also consider: Nanoboost: 3 oz/ac to maximize wheat goal				
When To Soil Sample	Spring, when tissue sampling, or fall					
When To Tissue Sample	Weekly after 350 GDUs, or at critical growth stages					

\* Nauxin can be mixed with Dicamba.

† October to December sampling for spring fertilizer applications, and March to April sampling for fall applications are preferred.

‡ Weekly tissue sampling will allow you to monitor plants fertility to achieve the highest yield. Tissue sampling should be done if deficiency symptoms appear.

### Useful Information:

- For optimum wheat growth, soil pH should be between 6.0 and 6.5.
- Wheat removes nutrients from the soil. If these nutrients are not replaced, the plant-available soil nutrient levels and soil fertility will be reduced.
- Refer to the table to the right to understand the amount of nutrients removed by producing 80 bu/a of wheat.

### Distinguishing between flowering stages in wheat (Feekes 10.5):



Figure 1

Figure 2

Figure 3

Figure 4

**Figure 1.** Feekes 10.5  
Heading growth stage.

**Figure 2.** Feekes 10.5.1  
Beginning flowering growth stage.

**Figure 3.** Feekes 10.5.2  
Flowering growth stage.

**Figure 4.** Feekes 10.5.3  
Full flower growth stage.

KNOTT 2016

### Nutrients (lbs) removed by wheat grain of a 80-bu/a crop

Nutrient	Grain Nutrient Removal Rates	Total Grain Nutrient Removed At Harvest
	Lbs of Nutrient/Bushel Grain	Lbs of Nutrient/Acre
N	0.96	77
P <sub>2</sub> O <sub>5</sub>	0.49	39
K <sub>2</sub> O	0.24	19
Ca	0.08	6
Mg	0.07	6
S	0.07	6
B	0.0003	0.03
Cu	0.0003	0.02
Fe	0.0025	0.20
Mn	0.0022	0.18
Zn	0.0015	0.12
Na	0.0003	0.03

Culman et al., 2019. Ohio State Extension

\* Program benefits are based upon results of field trials conducted by Monty's and third parties. Program benefits are not guaranteed and will vary based upon many factors including weather, soil type, and farming practices.



## CROP INFORMATION: WHEAT

### Deficiency Symptoms



**Nitrogen** deficient wheat plants appear pale-green to yellow with necrosis/chlorosis, and appear in older leaves.



**Boron** symptoms develop in younger leaves and spread to older growth. Symptoms appear as small chlorotic spots that began to enlarge and coalesce to form white stripes.



**Iron** deficiency is characterized by interveinal chlorosis of the leaves with the leaf veins remaining green.



**Zinc** deficiency symptoms appear as pale green plants with localized light-yellow chlorosis, that can turn into brown/gray necrotic lesions. Plants can be stunted.



**Sulfur** deficiency is characterized pale yellow color, uniform yellowing without necrosis.



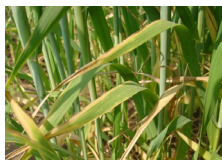
**Calcium** deficiency appears first on the youngest leaf and spreads to older leaves. Tips of leaves turn pale and began to roll inwards. Leaves may twist back, tear off, or die. The base of the leaves will remain green.



**Phosphorus** may cause dark green coloration of the leaves and a purple color to the leaves. Older leaves may be dark yellow to orange or brown.



**Manganese** deficiency will occur in patches throughout the field. Plants are stunted and symptoms appear as yellowing in the younger leaves, yellow striping of leaves and whitish to colorless spots.



**Potassium** deficiency appears as pale green plants that appear wilted or limp. Symptoms appear in the oldest leaves and have bright yellow chlorosis and brown necrosis along the margins.



**Magnesium** appears on the middle leaves as green, yellow with yellow interveinal chlorosis that can turn to brown necrosis.

### Soil & Tissue Sampling

#### SOIL SAMPLING RECOMMENDATIONS:

Take one soil sample for every 20 acres. This sample should consist of a composite of 15 subsamples taken randomly at a depth of 6-7 inches from across the sample area. The sample needs to be mixed well to be representative of the soil conditions.

**Soils that can be tested less often:** If the soil has a high CEC, it will hold cation nutrients better and the pH will remain constant over longer periods of time. It is still suggested to test throughout the growing season and at the end of the harvest for planning.

**Soil that should be frequently tested:** Soil with a low CEC (less than 7), some cations such as potassium (K<sup>+</sup>), magnesium (Mg<sup>++</sup>), and ammonium (NH<sub>4</sub><sup>+</sup>) have the ability leach through the root zone, so testing more often to find nutrient deficiencies is beneficial. When fertility levels are low, soil sampling should happen more frequently to insure best utilization of added nutrients and fertility.

**The key is consistency and getting the information back in time to use it.** This is why we encourage sampling at harvest to plan properly for the next growing season. While factors such as weather and crop rotation can affect soil test results, these differences are generally small enough that reliable information can still be obtained regardless of when sampling is done.

**For general practices:** October-December sampling for Spring fertilizer planning and applications, and March-April sampling for Fall/post harvest planning and applications. These two time periods generally have the lowest amounts of testing variability associated with them. **Give yourself adequate time to review the test results and plan the program before making fertilizer applications.**

#### TISSUE SAMPLING RECOMMENDATIONS:

**Timing:** Wheat tissue sampling is best completed once wheat breaks winter dormancy (Feekes 2-4); when leaf sheaths are erected and splitting the stem shows a hollow internode area about 1/2 inch in length. In addition to early season tissue sampling additional sampling should be taken in Feekes 8-9 and again in the heading and flowers stage. We encourage to achieve the highest yields possible to tissue sample throughout the growing season (early and often). Some of the high yielding growers tissue sample every week.

**Plant tissue to sample:** Wheat plants should be cut at about 1/2 inch above ground, collecting ~50 plants at Feekes 2-4. From Feekes 4-10 sample the flag leaves, 1st 4 blades, 1/3 of the way down the plant sampling 30-40 plants. In the flag leaf - maturity stage sample flag leaves from 30-40 plants.

**Storing and shipping:** Store the sample properly and remove soil or other debris that would interfere with tissue analysis and results. Problem areas or areas of interest should be sampled separately. All samples should be stored in a paper bag and in a cool place and properly labeled. All samples should be sent to the lab immediately to prevent any decay or damage to your sample that could cause your tissue results to be inaccurate.

**MONTY'S HIGH YIELD PROGRAM:** *Monty's high yield program can vary from a standard program by products, application rates, and application timing. If you are interested in a high yield program contact your Monty's representative or call 800.978.6342.*