



TISSUE SAMPLING CHEAT SHEET

Tissue sampling is a vital tool for evaluating the nutritional status of a crop during the growing season. It measures the actual nutrient levels within the plant, revealing deficiencies or imbalances that soil tests alone may not catch.

By identifying shortfalls early, tissue sampling allows growers to make timely, targeted in-season nutrient applications to correct deficiencies and optimize yield potential. It also helps evaluate the effectiveness of fertility programs and improves long-term decision-making by tracking trends across seasons.

TISSUE SAMPLING HOW TO?

First Identify the growth stage of crop your growing.

SOYBEAN PROTOCOL

V2-V6: In this stage, you are taking whole plant tissues. For the most accurate results, ensure there is no soil on the bottom of the plant. When pulling the sample, use a knife or box cutter to cut the plant slightly above the soil line. Pull 15 to 20 samples to ensure an adequate amount of tissue for the lab.

R1-R6: In the reproductive stage you are switching to the fully developed leaves at the top of the plant. Pull a minimum of 20 samples to ensure an adequate amount of tissue for the lab.

CORN PROTOCOL

V3-V5: In this stage, you are taking whole plant tissues. For the most accurate results, ensure there is no soil on the bottom of the plant. When pulling the sample, use a knife or box cutter to cut the plant slightly above the soil line. Pull 15 to 20 samples to ensure an adequate amount of tissue for the lab.

V6-VT: At the V6 stage you are sampling the top collared leaf. Determine if the leaf is collared by pulling it straight up. If the whole comes out with the leaf that leaf was not collared. Once you identify your top collared leaf, pull straight up and then back down again and the leaf should separate from the stalk. Pull 15 to 20 samples to ensure an adequate amount of tissue for the lab.

VT-R6: At the VT stage you are sampling the ear leaf. This leaf will be directly below the uppermost ear, where the silks are protruding from the stalk. Due to the translocation of nutrients in the plant, we will pull the ear leaf from here on out.



SOYBEANS

KEY TIMINGS AND WHAT TO LOOK FOR?

V2-V4: ESTABLISHMENT

Set the plant up for success by having good early season vigor and a cytokinin dominant plant. An elongated Tap root is key for soybeans. This ensures the plant is being set up for nodule production and you can search deeper in the soil profile for key nutrients such as Potassium. Stem diameter is also important in this stage, for water, sugar, and nutrient movement. The color and size of the leaves also play a huge role in determining early season plant health. The color and size determine how well that plant is taking in sunlight. The structure of the plant is determined by these key growth stages. At V3 the plant is already determining the 15th node.

Key Nutrients during these stages to look for on a tissue test:

- ✓ Calcium
- ✓ Boron
- ✓ Molybdenum
- ✓ Iron
- ✓ Manganese
- ✓ Phosphorus

V4-V8: CREATE/ NODULATION PUSH

Nodulation should be in full effect at this point of the growing season. This the time to push the production and creation of Nitrogen. The plant needs to be creating and exudating as much sugar as possible to form nodules and create nitrogen. At R3 most of the nodule creation stops as the plant is focused on direction the energy to the pods. So, the time is now.

Key Nutrients during these stages to look for on a tissue test:

- ✓ Nitrogen
- ✓ Phosphorus
- ✓ Manganese
- ✓ Molybdenum
- ✓ Calcium
- ✓ Boron

R1-R3: POLLINATION/REPRODUCTIVE PUSH

This phase is all about how well the plant transfers over into its reproduction. The plant is hitting puberty if you will, and it needs a healthy hormone balance to help it get through this tough time. In this phase the plant needs to have an abundance of energy accumulated for the processes that it endures.

Key Nutrients during these stages to look for on a tissue test:

- ✓ Phosphorus
- ✓ Nitrogen
- ✓ Calcium
- ✓ Zinc
- ✓ Copper
- ✓ Boron

R3-R4: MOVE PART 1/ CELL DIVISION

At these stages in beans, the plant is entering a critical window where it begins determining final kernel size and weight. This is when cell division inside each developing kernel is in full swing. Think of it like the plant building the framework or number of “rooms” in each kernel. The more cells the plant creates the more space is made for things like sugar and protein later on. This stage is extremely important for determining the potential of the grain weight.

Key Nutrients during these stages to look for on a tissue test:

- ✓ Calcium
- ✓ Boron
- ✓ Nitrogen
- ✓ Sulfur
- ✓ Manganese
- ✓ Potassium

R5-R6: MOVE PART 2/ GRAIN FILL

This is when the plant starts to fill the rooms that we created from R3-R4 time frame. Sugar and Protein need to move rapidly to find a spot and pack the seed full. This ensures for great seed weight. Hormones like Auxins are expressed to move the sugar where it needs to go. Stress mitigation is also important at this stage. If ethylene builds up in the plant than sugar movement automatically slows down. 45% of all soybean yields come from protein. This stage is extremely vital to move that into the grain.

Key Nutrients during these stages to look for on a tissue test:

- ✓ Potassium
- ✓ Boron
- ✓ Zinc
- ✓ Nitrogen

V2-V6: ESTABLISHMENT

Set the plant up for success by having good early season vigor and a cytokinin dominant plant. Early nodal root development is key in this stage. 80% of the water and nutrients taken up in that plants lifetime comes from its nodal root system. Stem diameter is also important in this stage, for water, sugar, and nutrient movement. The color and size of the leaves also play a huge role in determining early season plant health. The color and size determine how well that plant is taking in sunlight.

Key Nutrients during these stages to look for on a tissue test:

HIGH URGENCY:

- ✓ Calcium
- ✓ Zinc
- ✓ Boron
- ✓ Iron
- ✓ Manganese
- ✓ Phosphorus

V7-V14: RAPID UPTAKE

During this phase the plant is in high gear trying to accumulate as much Macro nutrients as possible. The goal is to mitigate as much stress as you can. If the plant is stressed than it will slow down uptake due to the fact that it is using energy to defend the stress off. Another thing that we need to try and do is limit nitrate build up in the plant at this time. The plant is taking up as much N as possible and doing so it's taking up a lot of Nitrate. Nitrate if not converted into a protein can also cause stress in the plant.

Key Nutrients during these stages to look for on a tissue test:

- ✓ Nitrogen
- ✓ Potassium
- ✓ Sulfur
- ✓ Molybdenum
- ✓ Nitrate
- ✓ Ammonium

V15-R1: POLLINATION/REPRODUCTIVE PUSH

This phase is all about how well the plant transfers over into its reproduction. The plant is hitting puberty if you will, and it needs a healthy hormone balance to help it get through this tough time. In this phase the plant needs to have an abundance of energy accumulated for the processes that it endures.

Key Nutrients during these stages to look for on a tissue test:

- ✓ Nitrogen
- ✓ Phosphorus
- ✓ Boron
- ✓ Zinc
- ✓ Potassium

R2-R3: MOVE PART 1/ CELL DIVISION

At these stages in corn, the plant is entering a critical window where it begins determining final kernel size and weight. This is when cell division inside each developing kernel is in full swing. Think of it like the plant building the framework or number of "rooms" in each kernel. The more cells the plant creates the more space is made for things like sugar and protein later on. Past R3 the plant cannot create any more rooms in the kernel for protein and sugar to be held. This stage is extremely important for determining the potential of the grain weight.

Key Nutrients during these stages to look for on a tissue test:

- ✓ Calcium
- ✓ Boron
- ✓ Manganese
- ✓ Phosphorus
- ✓ Sulfur
- ✓ Nitrogen

R4-R5: MOVE PART 2/ GRAIN FILL

This is when the plant starts to fill the rooms that we created from R2-R3 time frame. Sugar and Protein need to move rapidly to find a spot and pack the kernel full. This ensures for great seed weight. Hormones like Auxins are expressed to move the sugar where it needs to go. Stress mitigation is also important at this stage. If ethylene builds up in the plant than sugar movement automatically slows down.

Key Nutrients during these stages to look for on a tissue test:

- ✓ Potassium
- ✓ Zinc
- ✓ Iron
- ✓ Boron
- ✓ Nitrogen



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