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# Strawberry Tissue Analysis

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## Plant Tissue Nutrient Sufficiency Ranges for Strawberry\*

Nutrients	Sufficiency Range
N (%)	3.0–4.0
P (%)	0.2–0.4
K (%)	1.1–2.5
Ca (%)	0.5–1.5
Mg (%)	0.25–0.45
S (%)	0.15–0.4
Fe (ppm)	50–300
Mn (ppm)	30–300
Zn (ppm)	15–60
Cu (ppm)	3–15
B (ppm)	25–50

## Petiole Nitrate Nitrogen (NO<sub>3</sub>-N) for Bloom and Fruit\*

Week	Low	High
1	250	>500
2–3	2500	4000
4	2000	4000
5–8	1700	3200
9	900	2800
10	900	2500
11	600	1700
12	450	900

Sampling begins the first week of bloom and continues for 12 weeks. Target ranges updated October 2016.

\* Campbell CR, Miner GS. 2000. Strawberry, annual hill culture. In: Campbell CR, editor. Reference sufficiency ranges for plant analysis in the southern region of the United States. Raleigh (NC): NC Dept of Agriculture & Consumer Services. Southern Cooperative Series Bulletin 394: [www.ncagr.gov/agronomi/saaesd/scsb394.pdf](http://www.ncagr.gov/agronomi/saaesd/scsb394.pdf)

**Plant tissue analysis measures nutrient concentrations within growing plants.**

Testing of strawberry leaves and petioles provides information on whether or not nutrients are sufficient for optimum crop development. Petiole analysis measures nitrate-nitrogen levels, while leaf analysis measures levels of nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, manganese, copper, zinc, iron, boron, aluminum and sodium. Not only does it identify and verify observed nutrient deficiencies and/or toxicities, but it can also identify nutrient shortages before symptoms appear. Where nutrient levels are outside of the optimum range, nutrient management recommendations are provided.

**Plant tissue samples can be predictive or diagnostic.** *Predictive* samples are for routine monitoring of fertility in order to fine tune the fertilization program. *Diagnostic* samples are submitted to troubleshoot apparent nutrient problems. The best way to do this is to submit samples from "good" areas (normal-looking plants) and from "bad" areas (discolored, stunted or misshapen plants) and compare the results.

**Plant tissue samples must be properly collected and accurately submitted.**

Nutrient concentrations within the plant vary depending on the growth stage and on the plant part. Improperly collected tissue samples can produce unreliable results and lead to incorrect interpretations. To collect and submit a strawberry tissue samples, follow these guidelines.

- Include leaves and petioles from 20 to 25 plants within a uniform area. For example, all of the plant material in a single sample should be the same variety, growing on the same soil type, planted at the same time and having the same management history.
- Select the most recently mature, trifoliolate leaves (MRMLs). Those leaves are full-sized and green and consist of one petiole or leaf stalk with three leaflets. MRMLs are usually located three to five leaves back from the growing point.



- Detach the petioles from the leaves as you collect them, but submit them together as one sample.
- Fill out the NCDA&CS [Plant Sample Information](#) form, including fertilization history and environmental conditions. Provide correct growth stage at time of sampling. Growth refers to week of bloom and can be coded B1 through B12 (first through 12th week of bloom). Accurate management recommendations depend on this information.