



General Fertility Program for Plasticulture Strawberries in Eastern North Carolina

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These recommendations assume that nitrogen (N) has been applied preplant at 60 lb/acre and that phosphate and potash have been applied based on NCDA&CS soil-test recommendations. Fertigation treatments usually begin in late winter/early spring (around March 1st) about 45 days from the first planned date of harvest.

Getting Started

Begin by applying N at a rate of 5–7 lb/acre/week. Where soils are very sandy, the high rate (7 lb) may be more appropriate; on heavy, clay soils, try the lower rate (5 lb). Apply N all at once in a single application (5–7 lb/acre/week) or incrementally ($\frac{3}{4}$ –1 lb/acre/day). After fertigation, clean emitters by running water through them for 15–20 min. Continue this program until tissue testing indicates a reason to change.

Nitrogen-to-Potassium (N:K) Ratio

Regional agronomists have found from experience that a 1:2 ratio of N to K usually produces sweeter, firmer berries. One way is to use potassium nitrate (13-0-44). However, other fertilizer sources can be just as effective as long as they are combined so the 1:2 ratio is maintained.

Later in the season, a routine monitoring program of tissue sampling may indicate the need for calcium or sulfur. If so, switch to 15.5-0-0 (calcium nitrate) with 0-0-50 (potassium sulfate, 18% S) to keep the 1:2 N-to-K ratio in balance. This combination will supply sufficient calcium and sulfur. However, if 13-0-44 is used and a recommendation for sulfur is made, add Epsom salt (13% S) at a rate of 10 lb/acre to supply sulfur.

Micronutrient fertilizers should only be applied if a tissue sample taken during the growing season indicates a specific need.

Nutrient Monitoring with Plant Tissue Analysis

Tissue testing on a regular basis will indicate any plant nutrient imbalances before symptoms begin to show. To use this monitoring tool, begin collecting samples after fertilization is initiated and continue at two-week intervals throughout the growing season. Normally, sampling takes place over a 12- to 16-week period.

To obtain an accurate measure of nutrient status, submit a sufficient amount of plant tissue. When collecting a sample from a field of strawberries, randomly select 20 to 25 most recently mature leaves (3 leaflets per leaf) and the associated petioles. Immediately detach petioles from leaflets. Place leaf blades in a paper bag and the associated petioles in an envelope inside that bag. Send the tissue, the \$7 per-sample fee and a completed *Plant Sample Information* form (www.ncagr.gov/agronomi/pdffiles/isplant.pdf) to the NCDA&CS Agronomic Division. Results will be posted online approximately three working days after samples are received.

Watering

During early growth, a strawberry crop needs apply approximately 1 inch of water per acre per week. This rate translates to **3,879 gallons per day** or **27,154 gallons per week per acre**. Calculate the amount of water your system delivers and the length of time needed to put out 1 inch per acre per week. First, based on row spacing, determine the number of feet of tubing per acre (Table 1). Most strawberry fields typically have 5-ft row spacing.

Table 1. Feet of tubing per acre based on plant row spacing

Row Spacing (ft)	Tubing (ft/acre)
5	8,712
6	7,260
8	5,445
9	4,840
12	3,630

Next, calculate the amount of water being delivered to the crop. All drip tapes indicate how much water is discharged; 0.25 gallon per hour per emitter is a typical rate. Use the following formula to calculate how much water your system delivers per hour:

$$\text{tubing flow rate (gal./hr/emitter)} \times \text{emitter spacing (in.)} \div 12 \text{ in./ft} \times \text{amount of tubing (ft/acre)} \\ = \text{field flow rate (gal./hr/acre)}$$

Example 1

1 acre of strawberries with 5-ft row spacing, tubing flow rate listed as 0.25 gallon per hour per emitter and 12-inch emitter spacing: $0.25 \times 1 \times 8,712 = 2,178$ gal./hr/acre.

On sandy soils, applying all the needed water at once is likely to move nutrients out of the crop's feeding root zone. To overcome this problem, irrigate (or fertigate) in several cycles throughout the day in keeping with the general soil type. Sandy soils may need to be irrigated frequently in short durations; heavy clay soils will tolerate longer durations and, therefore, can be watered less frequently.

Example 1 continued

water needed in one day = 3,879 gal./day/acre
system flow rate = 2,718 gal./hr/acre

$3,879 \div 2,718 = 1.43$ hr/day (approximately 1½ hr) for irrigation (or fertigation) needed to achieve 1 inch/acre/week, if run daily

Calculating Nitrogen Fertilizer Rates — Sample Problems

$$\text{lb N needed} \div \%N \text{ in fertilizer} = \text{lb of fertilizer}$$

If you want to apply a rate of 7 lb/acre/week using 13-0-44, then $7 \div 0.13 = 54$ lb/acre 13-0-44.

If you want to apply a rate of 7 lb/acre/week using liquid 4-0-8, weighing 11 lb/gal., then $7 \div 0.04 = 175$ lb 4-0-8 and $175 \div 11 = 15.9$ gal./acre 4-0-8.

If you want to apply a rate of 1 lb/acre/day using 15.5-0-0, then $1 \div 0.155 = 6.5$ lb/acre 15.5-0-0.

Thank you for using agronomic services to manage nutrients and safeguard environmental quality.
— Steve Troxler, Commissioner of Agriculture