HortFact—3004
UK COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY — COLLEGE OF AGRICULTURE
Horticulture Department

Fertility Guidelines for Home Fruit & Nut Plantings

John Strang and Rick Durham
Extension Horticulture Specialists

Fruit plants are perennials and require a different fertility program from that commonly used for annual plants. This is because fertilizer applications made during the current season affect current year's winter hardiness and production the following year. In most fruit plants, nitrogen availability should be at its peak level during the spring, with levels dropping by mid-summer and at its lowest level in the fall to reduce the potential of winter injury. Strawberries are an exception since the flower buds are initiated in late August and early September.

Adjust the soil acidity before planting based on the pH preference of the plant (4.5 for blueberries and 6 to 6.5 for other fruit). Fertility adjustments before planting may be based on the recommendations for establishing fruit plantings given in Extension publication [*AGR-1. Lime and Nutrient Recommendations*.] It is best to work the fertilizer into the soil in advance of planting rather than to place it in the hole at planting. Roots that directly contact the undissolved fertilizer are subject to burn. During subsequent seasons, fertilizer applications should be based on the plant growth rate and health. Fruit and nut crops grown as specimen plants in a lawn often receive enough nutrients from the fertilizer applied to the lawn. Standard ornamental nitrogen application rates are 1-2 lbs of actual nitrogen per 1000 sq. ft. If fruit and nut trees are present, ensure that the fertilizer is applied to the lawn when trees are dormant. It is best in this case to determine if additional fertilizer is needed for the fruit trees based on the fruit tree terminal growth.

Normally nitrogen is the only plant nutrient needed on an annual basis. However, when phosphorus or potassium are low, 10-10-10 may be applied as shown in Table 1.

Table 1. Fertilizer Guidelines
(1/2 lb granular fertilizer is equal to approximately 1 cup)

Fruit	Desired Vegetative Growth[1]	Rate[2] (Distributed in drip line area)	Time
Tart Cherry	8" new terminal growth for mature trees; 1-3 year old trees may have double this amount of terminal growth	1/3 lb 15-0-0 or ½ lb 10-10-10 per tree per yr of age	Bloom
Pear	Less than 12" new terminal growth for mature trees; 1-3 year old trees may have double this amount of terminal growth	1/4 lb 15-0-0 or 3/8 lb 10-10-10 per tree per yr of age	Bloom
Apple	12-15" new terminal growth for mature trees; 1-3 year old trees may have double this amount of terminal growth	1/2 lb 15-0-0 or ¾ lb 10-10-10 per tree per yr of age	Bloom

[1] If average terminal growth is less than that listed in Table 1 under the desired vegetative growth, increase the quantity of nitrogen applied. If terminal growth exceeds the amount listed, reduce the quantity of nitrogen.
[2] Use a nitrogen fertilizer such as calcium nitrate 15-0-0 with a maximum of 4-6 lb per tree.

Table 1. (continued)

Fruit	Desired Vegetative Growth	Rate	Time
Peach, Plum	14-20" new terminal growth for mature trees; 1-3 year old trees may have double this amount of terminal growth	1/3 lb 15-0-0 or ½ lb 10-10-10 per tree per yr of age	Bloom
Strawberry	Dark green, avoid leggy growth	5 lb 10-10-10 per 100 ft of row [3]	After fruiting (June-July)
Blackberry, Raspberry	Dark green	7-20 lb 15-0-0 or 10 -30 lb 10-10-10 per 100 ft of row	February
Grape	Dark brown, 3/8" diameter for current season canes	0.4 lb 15-0-0 or 0.7 lb 10-10-10 per vine 0.4 lb 15-0-0 or 0.7 lb 10-10-10 per vine	April 1 Fruit set
Blueberry	Green-first year	1 lb ammonium sulfate per 100 ft of row ¾ lb 10-10-10 per 100 ft of row	6 weeks after planting 6 weeks later
	2nd year & thereafter	5 lb 10-10-10 per 100 ft of row 2½ lb ammonium sulfate per 100 ft of row 2 lb ammonium sulfate per 100 ft of row	February Bloom 6 weeks later

Nuts	Comments	Time
Black Walnut Persian Walnut Chinese Chestnut Heartnut Hican Hickory Nut Pecan	Do not fertilize nut trees at planting. After the first year, apply 1 lb of 10-10-10 per in. of trunk diameter measured at 5 in. above the ground. Trees 15-25 inch in diameter may require 2 lb of 10-10-10 per inch of trunk diameter. If soil phosphorus and potassium levels are high, only nitrogen may be needed. Distribute fertilizer at the tree dripline where most feeder roots are located. Bearing trees should have 4-8 inches of new terminal growth, while young non-bearing tees should have double this amount of growth	February

[3] Apply when leaves are dry, brush fertilizer off of leaves.

Table 2. – Average Plant Food Content of Natural and Organic Fertilizer Materials (% dry weight)

Organic Materials	%N	%P	%K	Availability	Acidity
Fish Meal	10.0	4.0	---	slow	acid
Guano, Peru	13.0	8.0	2.0	moderate	acid
Guano, Bat	10.0	4.0	2.0	moderate	acid
Dried Blood	12.0	1.5	0.8	moderate, slow	acid
Soybean Meal	7.0	1.2	1.5	slow	very slightly acid
Tankage, Animal	6.0	3.0	0.1	slow	acid
Tobacco Stems	1.5	0.5	5.0	slow	alkaline
Seaweed	1.0	---	4.0-10.0	slow	---
Bone Meal	3.5	22.0	---	slow	alkaline
Urea	45.0	---	---	quick	acid
Wood Ashes	---	2.0	4.0-10.0	quick	alkaline
Cotton Seed Meal	6.0	2.5	1.5	slow	acid
Ground Rock Phosphate	---	33.0	---	very slow	alkaline
Green Sand	---	1.0	6.0	very slow	---
Basic Slag	---	8.0	---	quick	alkaline
Horn and Hoof Meal	12.0	2.0	---	---	---
Peat	1.5-3.0	0.25-0.5	0.5-1.0	very slow	acid

NOTE: Urea is an organic compound; since it is synthetic, it is doubtful that most organic gardeners would consider this acceptable.

It should be noted that when using organic material, many nutrients are not readily available for plant growth. The rate at which nutrients become available depends on a number of soil and environmental conditions. If the organic material continues to release nitrogen late into the fall, it will reduce plant hardiness.

Table 3. – Composition of Manure

Source of Manure	% Water	% N	%P	%K
Cow	86	0.55	0.15	0.50
Duck	61	1.10	1.45	0.50
Goose	67	1.10	0.55	0.50
Hen	73	1.10	0.90	0.50
Hog	87	0.55	0.30	0.45
Horse	80	0.65	0.25	0.50
Sheep	68	1.00	0.75	0.40
Steer or feed yard	75	0.60	0.35	0.55
Turkey	74	1.30	0.70	0.50

When substituting organic materials for commercial fertilizer recommendations, it is important to provide the same quantities of plant nutrients. The numbers on a commercial fertilizer bag indicate the percentages of the three major nutrients in the fertilizer (nitrogen, phosphorus, and potassium). The numbers are always listed in the same order with N being first, P_2O_5 second, and K_2O third, but commonly referred to as %N, %P and %K.

Table 4. – Composition of Compost Materials

Compost Material	%N	%P	%K
Banana Skins (ash)[1]	---	3.3	41.8
Cantaloupe Rinds (ash)	---	9.8	12.2
Cattail Reeds	2.0	0.8	3.4
Coffee Grounds	2.1	0.3	0.3
Corncob Ash	---	---	50.0
Corn Stalks and Leaves	0.3	0.1	0.3
Feathers	15.3	---	---
Fish Scrap	2.0-7.5	1.5-6.0	---
Home Compost Average	2.0	1.0	2.0
Pine Needles	0.5	0.1	0.03
Tea Grounds	4.2	0.6	0.4
Thoroughbred Compost (from horse barns)	2.0	1.0	2.0
Wood Ashes	---	1.0	4.0-10.0

[1] Ash is on a dry-weight basis.

Please see the Extension publication, [*HO-75. Home Composting: A Guide to Managing Yard Waste*] for information on composting.

One hundred pounds of 16-24-8 would supply the soil with 16 lb of N, 24 lb of P_2O_5 and 8 lb of K. The same nutrient levels could also be obtained by applying the following combination of organic materials.

	N (lb)	P (lb)	K (lb)
133 lb of horn and hoof meal	16	2 1/3	
133 lb of green sand		1 1/3	8
61 1/3 lb of ground rock phosphate		20 1/3	
Total	16	24	8

Table 5. – Fertilizer Composition of Common Commercial Fertilizers

Ammonium nitrate	33.5-0-0
Ammonium sulfate	21-0-0
Calcium nitrate	15.5-0-0
Potassium chloride (muriate of potash)	0-0-62
Potassium nitrate	13-0-44
Potassium sulfate	0-0-50
Superphosphate	0-20-0
Triple superphosphate	0-46-0

Certain material in this fact sheet was adapted from "Organic Gardening in South Carolina," Clemson University.

 Issued: 6/79 Revised 4/16