ROSE FERTILIZER REQUIREMENTS

In the Mid-Atlantic Region a rose bush, on average, uptakes the essential nutrients shown each year. Chlorine is abundant in nature and ignored. The shaded nutrients are most important in determining fertilizer requirements. Fall applications of dolomitic lime to correct pH assures Ca & Mg are at adequate levels. The minors (except Fe) are rarely deficient and are provided in most soluble fertilizers.

Major Nutrient	Lbs Nutrient per 1000 sq ft	Minor Nutrient	Lbs Nutrient per acre
N	16	Fe	4.5
P_2O_5	7	Mn	1.5
K_2O	16	Zn	0.9
Ca	9	B	0.8
Mg	4	Cu	0.3
S	5	Mo	0.2

Nominal Rose Nutrient Uptake per Year

Fertilizer requirements are often higher than the uptake levels, because of what happens to fertilizer in the soil. Nitrogen (N) losses due to volatilization and leeching can be substantial. Phosphate (P_2O_5) and iron (Fe) interact with soil minerals to form precipitates that are unavailable to plants. Potash (K_2O) is very close to its uptake level. Sulfur (S), like N, is highly mobile in soil and subject to leeching and needs to be replenished several times each year.

Nutrient	Amount
N	24 to 48 lbs per 1000 sq ft
P_2O_5	14 to 28 lbs per 1000 sq ft
K_2O	16 to 32 lbs per 1000 sq ft
S	7 to 12 lbs per 1000 sq ft
Fe	10 to 20 lbs per acre - chelated
	45 to 90 lbs/acre - non-chelated

Annual Fertilizer Recommendation

The challenge for the rosarian then is to select fertilizers that provide the nutrients shown to satisfy the level of performance expected as well as time and money limitations. Although roses require a balanced diet of all the nutrients to perform well, nitrogen (N) is arguably the most important. Acceptable values range as high as 48 lbs N/1000 sq ft used by exhibitors, to little or no fertilizer on roses often found on old estates and cemeteries. Normally, a fertilizer program providing between 16 and 32 lbs of N/1000 sq ft should result in good performance.

The inside table of this brochure is intended to aid in the establishment of a fertilizer program. It contains fertilizers commonly found in the DC area. Listed for each is the ***NPK*** content, 1/***density***, type of ***nitrogen***, estimated N ***duration***, nominal ***quantity*** recommended each application, ***rate*** in % that quantity represents, and the ***nutrients*** provided by that quantity.

Rate is a measure of the effectiveness of the quantity of nitrogen fertilizer applied, where a nominal rate of 100% is recommended. Rates for applications whose nitrogen durations overlap are additive and should not exceed 250%, especially in hot weather.

The ***density***$^{-1}$, cups/lb, when multiplied by lbs in a bag provides an estimate of the number of cups in a bag.

Fertilizer ***nitrogen*** come in several types (Organic, urea, NH_4^+ & NO_3^-), which effects the ***duration***, and determines the spacing between applications.

The ***quantity*** in cups or tbsp is for an average size rose with a 30 inch dripline diameter. For larger bushes apply more, and for smaller bushes less, as shown by the conversion table.

Drip Line Dia Inches	Area Sq ft	Conversion
48	12.566	X2.56
36	7.069	X1.44
30	4.909	X1.00
24	3.142	X0.64
18	1.767	X0.36
15	1.227	X0.25
12	0.785	X0.16
10	0.545	X0.11

Sample fertilizer program:

	Quantity	Rate	N	P_2O_5	K_2O	S	Fe
Apr 1	1 gal LF *	28	0.99	1.95	1.32	2.0	8.37
Apr 15	1 cup Mills Magic	65	4.5	3.8	0.8	-	-
Apr 15	1 cup alfalfa meal	25	1.8	0.3	1.2	-	-
Arp 15	1 cup fish meal	81	5.7	1.9	0.6	-	-
Apr 15	1 cup kelp meal	12	0.8	0.1	1.7	-	-
Apr 15	2 tbsp potash	-	-	-	8.8	-	-
May 1	1 gal LF **	28	0.99	1.95	1.32	2.0	0.27
May 15	0.5 cup blood meal	70	3.5	-	-	-	3.5
Jun 1	1 gal LF	28	0.99	1.95	1.32	2.0	0.27
Jun 15	1 cup alfalfa meal	25	1.8	0.3	1.2	-	-
Jun 15	0.5 cup Blood Meal	70	3.5	-	-	-	3.5
Jul 1	1 gal LF	28	0.99	1.95	1.32	2.0	0.27
Jul 15	0.5 cup Blood Meal	70	3.5	-	-	-	3.5
Aug 1	1 gal LF **	28	0.99	1.95	1.32	2.0	0.27
Aug 15	1 cup alfalfa meal	25	1.8	0.3	1.2	-	-
Aug 15	0.5 cup Blood Meal	70	3.5	-	-	-	3.5
Sep 1	1 gal LF **	28	0.99	1.95	1.32	2.0	0.27
Total Program		-	36.3	18.4	23.4	12.0	23.7

* incl Sequestrene FE ** incl SUPERthrive

For liquid formula (LF), mix in one gallon of water:

LF	Rate	N	P_2O_5	K_2O	S	Fe
1 tbsp Jack's 10-30-20	22	0.63	1.88	1.25	-	0.27
2 tbsp Epsom salt	-	-	-	-	2.0	-
1 tbsp Fish Emulsion	6	0.36	0.07	0.07	-	-
1 tbsp humic acid	-	-	-	-	-	-
1 tsp Sequestrene 330 FE	-	-	-	-	-	8.1
0.375 tsp SUPERthrive	-	-	-	-	-	-
Total Liquid Formula	28	0.99	1.95	1.32	2.0	8.37

Notice how the Total Program compares with the Annual Fertilizer Recommendations Table. The sum of the rates for Apr 15 feeding is Mills 65% + alfalfa 25% + fish 81% + kelp 12% = 183%, well below the 250% limit. But, note the Blood Meal on May 15 overlaps with the April 15 feeding by 3 weeks, during which the sum of the rates is 183% (Apr 15) + 70% (May 15) = 253%, slightly above the 250% limit but OK as long as you water well (at least 4 to 5 gallons twice a week). The liquid formula provides additional nutrients (including minors) and growth stimulants.

rev Apr 2012

FERTILIZING ROSES (ADVANCED)

Arlington Rose Foundation

Affiliated with the
American Rose Society

Published by
Arlington Rose Foundation
www.arlingtonrose.org

Fertilizer	Nutrients (%NPK)	Density[-1] cup/lb	Nitrogen urea	Nitrogen NH_4^+	Nitrogen NO_3^-	N Dur (wks)	Quant	Rate %	Nutrients Delivered (lbs/1000 sq ft) N	P_2O_5	K_2O	S	(lbs/A) Fe
Extended Duration													
Osmocote 98605 (8-9 mon)	18-5-12 †	1.76	0	9.5	8.5	28	1.5 cups	112	31.3	8.7	20.9	8.7	37.9
Osmocote Plus (6 mon)	15-9-12 †	1.76	0	8	7	18	1 cup	97	17.4	10.4	13.9	4.6	22.7
Greenview Late Fall (IBDU)	31-0-0	3.08	31	0	0	16	3/4 cup	96	15.4	0	0	0	0
Organics													
Espoma Plant-tone	5-3-3	2.44	organic			7	2 cups	119	8.3	5.0	5.0	1.7	0
Espoma Rose-tone	4-3-2	2.53	organic			7	2.5 cups	115	8.1	6.0	4.0	4.0	0
Mills Magic Rose Mix	6-5-1	2.71	organic			7	2 cups	129	9.0	7.5	1.5	0	0
Fertrell Rose Food	4-2-4	1.78	organic			7	2 cups	131	9.1	4.6	9.1	0	0
Organic Mix *	6.8-3.3-0.8-0.4Fe	2.96	organic			7	2 cups	134	9.4	4.6	1.1	0	24.9
Alfalfa Meal	3-0.5-2	3.46	organic			7	1 cup	25	1.8	0.3	1.2	0	0
Blood Meal	12-0-0-0.3Fe	3.51	organic			5	1 cup	139	7.0	0	0	0	7.1
Bone Meal	4-12-0	2.08	organic			7	1 cup	56	3.9	11.7	0	0	0
Fish Meal	9-3-1	3.22	organic			7	1 cup	81	5.7	1.9	0.6	0	0
Kelp Meal	1-0.2-2	2.41	organic			7	1 cup	12	0.8	0.1	1.7	0	0
Cottonseed Meal	6-2-1	2.77	organic			7	1 cup	63	4.4	1.5	0.7	0	0
Manure	1-1-1	2.79	organic			7	10 cups	104	7.3	7.3	7.3	0	0
Milorganite	5-2-0-4Fe	2.44	organic			7	4 tbsps	15	1.0	0.4	0	0	36.4
* Mix equal parts of alfalfa meal, fish meal, cottonseed meal, blood meal, bone meal & half part Milorganite													
Granular													
Vegetable Grower	10-10-10 †	1.70	0	10	0	5	1/2 cup	120	6.0	6.0	6.0	6.9	2.6
Ammonium Sulfate	21-0-0-24S	1.88	0	21	0	5	1/4 cup	114	5.7	0	0	6.5	0
Urea	46-0-0	2.59	46	0	0	6	4 tbsps	151	9.0	0	0	0	0
20-20-20 Granular	20-20-20	2.00	20	0	0	6	1/4 cup	85	5.1	5.1	5.1	0	0
Soluble													
Potassium Nitrate	13.75-0-46	1.65	0	0	13.75	2	1 tbsp ★	53	1.06	0	3.54	0	0
Jack's Blossom Booster	10-30-20 †	2.03	0	5	5	3	1 tbsp ★	22	0.63	1.88	1.25	0	0.27
Peters Professional GP	20-10-20 †	1.80	0	8	12	2.5	1 tbsp ★	54	1.42	0.71	1.42	0	0.31
Peters Professional GP	20-20-20 †	2.10	7.8	6.9	5.3	4	1 tbsp ★	32	1.21	1.21	1.21	0	0.13
Miracle-Gro Blossom Boost	15-30-15 †	2.56	9.2	5.8	0	5.5	1 tbsp ★	13	0.75	1.49	0.75	0	0.33
Jack's Classic All Purpose	20-20-20 †	2.37	17.9	0	2.1	5	1 tbsp ★	22	1.08	1.08	1.08	0	0.23
Miracle-Gro for Roses	18-24-16 †	2.17	15.6	2.4	0	6	1 tbsp ★	18	1.06	1.41	0.94	0	0.26
Fish Emulsion	5-1-1	----	organic			6	1 tbsp ★	6	0.36	0.07	0.07	0	0
Supplements													
Gypsum	21Ca-17S	1.62	0	0	0	n/a	4 tbsps	n/a	0	0	0	5.3	0
Green Sand	0-0-0.1	1.37	0	0	0	n/a	4 cups	n/a	0	0	0.6	0	0
Epsom salts	10Mg-14S	1.85	0	0	0	n/a	1 tbsp ★	n/a	0	0	0	1.0	0
Sul-Po Mag	22K-11Mg-22S	1.27	0	0	0	n/a	2 tbsps	n/a	0	0	4.4	4.4	0
Potash (Muriate of)	60K	1.73	0	0	0	n/a	1 tbsp	n/a	0	0	4.4	0	0
Sulfate of Potash	50K-18S	1.44	0	0	0	n/a	1 tbsp	n/a	0	0	4.4	1.6	0
Superphosphate	0-20-0	1.81	0	0	0	n/a	2 tbsps	n/a	0	2.8	0	0	0
Triple Superphosphate	0-45-0	1.80	0	0	0	n/a	1 tbsp	n/a	0	3.2	0	0	0
Sequestrene 330 Fe Chelate	0-0-0-10Fe	2.29	0	0	0	n/a	1/3 tbsp ★	n/a	0	0	0	0	8.1
Peters S.T.E.M.	minors only	1.71	0	0	0	n/a	1/4 tbsp ★	n/a	0	0	0	0.2	6.1
Dragon Fe Chelate w/minors	0-0-0-6Fe †	----	0	0	0	n/a	1/2 tbsp ★	n/a	0	0	0	0.2	10.3

Specialty Growth Stimulate Additives

Humic Acid ★	1 tbsp/gal/bush/month	● improves CEC, soil structure & mineralization (by 20x) of nutrients,
Humates	2 tbsp/bush - 3 times a year [@ planting time: 6 tbsp/bush]	● same benefits as Humic Acid - use either
SuperThrive ★	0.125 tbsp/gal/bush - up to monthly (1/4 cup/32 gal)	● stimulates growth (triacontanol)
Organica PGA Plus ★	0.025 tbsp/gal/bush/month (0.8 tbsp/32 gal) [@ planting time: 1 tbsp/bush]	● beneficial microorganisms
Response	Foliar feeding - 1tbsp per gallon of spray - apply monthly	● stimulates growth & resistance to disease

† Contains minors ★ Mix with 1 gal water and apply as a liquid ground drench around each bush