

Citrus

Nutrition and Soil Fertility

By Oscar F. Ruiz Jr. D.P.M.

Soil type: Well-draining
pH: Mildly acid to mildly alkaline soils (6.0-7.5)

Figure 1. N, P₂O₅, K₂O citrus fertilizer application guide by age or harvest.

From: [Food & Fertilizer Technology Center. 2003. Fertilizer Management for Citrus Orchards.](#)

Age or Harvest per Tree	lb/tree/year		
	N	P ₂ O ₅	K ₂ O
1-3 years	0.17	0.17	0.17
5 years	0.34	0.34	0.34
90 lb	1.1	0.55	0.83
130 lb	1.3	0.68	1.0
200 lb	1.8	0.88	1.1
260 lb	2.2	1.1	1.7
330 lb	2.6	1.4	2.0

Figure 2. N, P₂O₅, K₂O citrus fertilizer distribution guide according to growth stage.

From: [Food & Fertilizer Technology Center. 2003. Fertilizer Management for Citrus Orchards.](#)

Nutrient	Growth Stage		
	Post harvest/spring flush	Fruit set	Late fruit set
	%		
Nitrogen	40	40	20
P ₂ O ₅	40 - 100	0 - 40	0 - 20
K ₂ O	30	30	40



Proper citrus nutrition cannot be based solely on soil analyses results. Soil analyses may or may not be representative of what nutrients are available to the plant. Actual plant nutrient availability can only be determined by a plant tissue analysis. Soil analyses and plant tissue analyses results should be used together to determine a more effective approach to citrus nutrition.

Figure 3. Plant tissue sufficiency levels for sweet orange 'Valencia' .
From: Mills, H. A. y J. B. Jones Jr. 1996. Plant Analysis Handbook II.

Element	N %	P %	K %	Ca %	Mg %	S %	B ppm	Zn ppm	Mn ppm	Fe ppm	Cu ppm
High	3.50	0.50	3.00	4.00	0.50	0.50	100	150	200	250	35
Low	2.20	0.12	1.20	1.10	0.30	0.25	25	25	25	60	6

Development stage: *With fruit*
Plant part: Mature leaves subtending fruit
Quantity: 30+ leaves

Figure 4. Plant tissue sufficiency levels for sweet orange 'Valencia' .
From: Mills, H. A. y J. B. Jones Jr. 1996. Plant Analysis Handbook II.

Element	N %	P %	K %	Ca %	Mg %	S %	B ppm	Zn ppm	Mn ppm	Fe ppm	Cu ppm
High	2.70	0.16	1.10	2.60	0.70	0.40	100	100	200	120	20
Low	2.20	0.12	0.70	1.50	0.25	0.20	30	25	25	60	5

Development stage: *Without fruit*
Plant part: Mature leaves from vegetative shoots
Quantity: 30+ leaves



Figure 5. Plant tissue sufficiency levels for persian lime (*C. aurantiifolia*).
From: Mills, H. A. y J. B. Jones Jr. 1996. Plant Analysis Handbook II.

Element	N %	P %	K %	Ca %	Mg %	S %	B ppm	Zn ppm	Mn ppm	Fe ppm	Cu ppm
High	3.00	0.50	2.50	5.00	1.00	0.50	100	100	200	200	35
Low	2.40	0.15	1.60	1.50	0.25	0.15	30	20	20	60	5

Development stage: *Without fruit*
Plant part: Mature leaves from vegetative shoots
Quantity: 30+ leaves

Figure 6. Plant tissue sufficiency levels for lemon (*Citrus limon*) .
From: Mills, H. A. y J. B. Jones Jr. 1996. Plant Analysis Handbook II.

Element	N %	P %	K %	Ca %	Mg %	S %	B ppm	Zn ppm	Mn ppm	Fe ppm	Cu ppm
High	2.70	0.30	2.00	4.00	0.50	0.50	100	75	200	200	35
Low	2.20	0.10	1.00	1.50	0.20	0.15	20	20	20	60	5

Development stage: *Without fruit*
Plant part: Mature leaves from vegetative branches
Quantity: 30+ leaves

Figure 7. Plant tissue sufficiency levels for grapefruit (*Citrus paradisi*) .
From: Mills, H. A. y J. B. Jones Jr. 1996. Plant Analysis Handbook II.

Element	N %	P %	K %	Ca %	Mg %	S %	B ppm	Zn ppm	Mn ppm	Fe ppm	Cu ppm
High	2.60	0.30	2.00	4.00	0.50	0.50	100	75	200	200	35
Low	2.00	0.10	1.00	1.50	0.20	0.15	20	20	20	60	5

Development stage: *With fruit*
Plant part: Mature leaves subtending fruit
Quantity: 30+ leaves



Figure 8. Plant tissue sufficiency levels for grapefruit (*Citrus paradisi*).
From: Mills, H. A. y J. B. Jones Jr. 1996. Plant Analysis Handbook II.

Element	N %	P %	K %	Ca %	Mg %	S %	B ppm	Zn ppm	Mn ppm	Fe ppm	Cu ppm
High	3.00	0.50	2.20	5.50	0.75	0.50	100	100	200	200	35
Low	2.40	0.10	0.80	1.50	0.25	0.15	30	25	25	60	5

Development stage: *Without fruit*
Plant part: Mature leaves from new growth
Quantity: 30+ leaves

Figure 9. Plant tissue sufficiency levels for mandarin (*C. reticulata*).
From: Mills, H. A. y J. B. Jones Jr. 1996. Plant Analysis Handbook II.

Element	N %	P %	K %	Ca %	Mg %	S %	B ppm	Zn ppm	Mn ppm	Fe ppm	Cu ppm
High	3.50	0.25	1.10	2.60	0.50	0.50	100	30	200	200	20
Low	3.00	0.15	0.90	1.10	0.30	0.15	30	10	25	50	5

Development stage: *Without fruit*
Plant part: Mature leaves from vegetative shoots
Quantity: 30+ leaves

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References

Food & Fertilizer Technology Center. 2003. Fertilizer Management for Citrus Orchards.

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