

Nitrogen Requirements for Vegetables on Mineral Soils

CROPS	N REQUIRED kg N/ha
Potatoes	Expected Marketable Yield (t/ha)
Main Crop	15
	20
	25
	30+
Early Crop	50
Garden - no print-out, adjust depending on species	75
Snap beans, lima beans, peas - with P ₂ O ₅ and K ₂ O	130
- where no P ₂ O ₅ or K ₂ O is required	200
Tomato* - no print-out; to be recommended by specialist.	70
<u>Fresh Market Tomatoes</u> : -apply 35-50 kg N/ha preplant broadcast, and sidedress at first fruit set with 35-50 kg N/ha.	60
<u>Processing Tomatoes</u> : - apply N as preplant broadcast. <u>-open pollinated varieties</u> : 70-90 kg N/ha (with >2% soil organic matter), 100-120 kgN/ha (<2% organic matter). <u>-hybrid varieties</u> : 90-120 kg N/ha (>2% organic matter), 160-180 kg N/ha (<2% organic matter).	15
<u>Fertigated Processing Tomatoes</u> : - Coarse textured soils with <3.2% OM, apply up to 300 kg N/ha, with 40% applied pre-plant and the balance through the drip line. All other soils, apply up to 80 kg N/ha, with 60% applied preplant and the balance through the drip line.	0
Tomato* - no print-out; to be recommended by specialist.	70-100
<u>Processing Tomatoes</u> : - apply N as preplant broadcast. <u>-open pollinated varieties</u> : 70-90 kg N/ha (with >2% soil organic matter), 100-120 kgN/ha (<2% organic matter). <u>-hybrid varieties</u> : 90-120 kg N/ha (>2% organic matter), 160-180 kg N/ha (<2% organic matter).	70-180
<u>Fertigated Processing Tomatoes</u> : - Coarse textured soils with <3.2% OM, apply up to 300 kg N/ha, with 40% applied pre-plant and the balance through the drip line. All other soils, apply up to 80 kg N/ha, with 60% applied preplant and the balance through the drip line.	80-300
Cucumber, muskmelon, watermelon, pumpkin, squash	110
Broccoli, brussels sprout, cauliflower**	130
Cabbage**	170
Peppers*, eggplant*	70
Rutabagas and turnips	35
Celery	195
Rhubarb	280
Beet, onion, spinach, lettuce, endive, garlic, chives, carrots, horseradish, parsnip	110
Sugarbeet***	Following Grain Corn
	120-150
	Following Other Crops
	100-130
Radish	60
Sweet potato (cultivar "Beauregard")	50
Asparagus, nursery - work in before seeding. If rainfall is excessive an additional 50 kg N may be applied in August or early September.	75
Asparagus – new and established plantings. For new plantings, apply all the N pre-plant. For established plantings, apply half the N in early spring and half after harvest.	110
Ginseng	40

* For transplanted tomatoes, peppers and eggplant apply a starter solution high in phosphorus such as 10-34-0 at 1 L/100 L or 6-24-6 at 1 L/75 L of water at planting. Under high temperatures and on sandy soils use half the concentration of fertilizer but do not reduce the volume of water.

** For transplanted broccoli, brussels sprouts, cabbage and cauliflower, if no insecticide is used in the planting water apply a starter solution high in nitrogen such as 20-20-20 at 1 kg/200 L of water. Under high temperatures and in dry sandy soils use half the concentration of fertilizer.

*** Excess nitrogen has an adverse effect on sugar content, without increasing tons per acre of sugarbeets.

Phosphorus Requirement Table - Vegetables on Mineral Soils

Soil Phosphorus (0.5 M sodium bicarbonate extract) mg P L ⁻¹ of soil (ppm P)	Snap bean, lima bean, field bean, soybean, pea, established L ⁻¹ of soil (ppm P)	Rutabaga, beet, onion, spinach, lettuce, endive, garlic, chive, carrot, parsnip, horseradish	Sweet corn, established asparagus	Sugar asparagus	Beet	Radish	Required - kg/ha Phosphate (P ₂ O ₅)
0-3	80 HR	80 HR	110 HR	150 HR	180 HR	200 HR	230 HR
4-5	60 HR	70 HR	100 HR	140 HR	170 HR	200 HR	230 HR
6-7	50 HR	60 HR	90 HR	140 HR	170 HR	190 HR	220 HR
8-9	40 HR	60 HR	70 HR	130 HR	160 HR	190 HR	220 HR
10-12	30 MR	50 MR	50 HR	130 MR	160 HR	180 HR	210 HR
13-15	20 MR	50 MR	20 MR	120 MR	150 HR	170 HR	190 HR
16-20	0 LR	40 LR	20 MR	100 LR	140 HR	160 HR	170 HR
21-25	0 LR	40 LR	20 LR	90 LR	120 MR	140 MR	140 MR
26-30	0 RR	30 LR	20 LR	70 RR	100 MR	120 MR	110 MR
31-40	0 RR	30 LR	0 RR	50 RR	80 MR	90 MR	80 MR
41-50	0 RR	20 LR	0 RR	30 RR	50 LR	50 MR	50 MR
51-60	0 RR	0 LR	0 RR	0 RR	30 LR	30 LR	30 LR
61-80	0 NR*	0 RR	0 NR*	0 NR*	0 RR	30 LR (0 RR)* [†]	0 RR
80+	0 NR*	0 NR*	0 NR*	0 NR*	0 NR*	30 LR (0 NR*) [†]	0 NR*

* adding nutrients to soils with these levels of nutrients may reduce crop yields or quality by interfering with the uptake of other nutrients.

** For transplanted tomatoes, peppers and eggplant apply a starter solution high in phosphorus such as 10-34-0 at 1 L/100 L of water or 6-24-6 at 1 L/75 L of water at planting. Under high temperatures and on sandy soils, use half the concentration of fertilizer.

*** For transplanted broccoli, brussels sprouts, cabbage and cauliflower, if no insecticide is used in the planting water, apply a starter solution high in nitrogen such as 20-20-20 at 1 kg/200 L of water. Under high temperatures and in dry sandy soils use half the concentration of fertilizer but do not reduce the volume of water.

[†] Garden in brackets.

HR, MR, LR, RR, and NR denote, respectively, high, medium, low, rare and no probabilities of profitable crop response to applied nutrient.

Broccoli***, brussels sprout ***, cabbage***, cauliflower***, pepper, eggplant*** new or nursery planting of ginseng and asparagus

Potassium Requirement Table - Vegetables on Mineral Soils

Soil Potassium (1 M ammonium acetate extract) mg K L ⁻¹ of soil (ppm K)	Snap bean, lima beans, field beans, soybeans, peas	Sweet corn	Sugar beet**	Tomato(paste, fresh market) Cucumber, muskmelon, watermelon, pumpkin, squash, ginseng	Tomato(paste, Beet, onion, spinach, lettuce, endive, garlic, chive, carrot, horseradish, parsnip, potato, garden eggplant	Broccoli, brussels sprout, cabbage, cauliflower, pepper, rhubarb	Rutabaga** , turnip, celery, rhubarb	Asparagus (all plantings)	Tomato (whole pack)**
0-15	60 HR	120 HR	170 HR	180 HR	230 HR	230 HR	270 HR	340 HR	420 HR
16-30	60 HR	110 HR	160 HR	170 HR	220 HR	220 HR	250 HR	330 HR	400 HR
31-45	50 HR	90 HR	140 HR	160 HR	200 HR	210 HR	230 HR	310 HR	360 HR
46-60	50 HR	80 HR	110 HR	140 HR	180 HR	190 HR	200 HR	280 HR	320 HR
61-80	40 MR	60 MR	80 HR	120 HR	140 HR	160 HR	170 HR	250 HR	280 HR
81-100	30 MR	40 MR	50 MR	90 MR	100 HR	130 HR	130 HR	200 HR	250 HR
101-120	30 MR	30 MR	30 MR	70 MR	70 MR	100 MR	100 MR	150 MR	220 HR
121-150	20 MR	0 LR	0 LR	20 MR	50 MR	80 MR	80 MR	90 MR	190 MR
151-180	20 MR	0 RR	0 RR	0 LR	40 MR	50 MR	50 MR	50 MR	160 MR
181-210	0 LR	0 RR	0 RR	0 LR	0 LR	0 LR	0 LR	0 LR	130 MR
211-250	0 RR	0 RR	0 RR	0 RR	0 RR	0 RR	0 RR	0 RR	80 MR
250+	0 NR*	0 NR*	0 NR*	0 NR*	0 NR*	0 NR*	0 NR*	0 NR*	0 LR

* adding nutrients to soils with these levels of nutrients may reduce crop yields or quality by interfering with the uptake of other nutrients.

** For whole pack tomatoes and rutabagas on soils with magnesium tests less than 100 the required amount of potash should be adjusted downward from the amounts shown to a minimum rate of 50% of table values at a magnesium test of 50. Fertilizer rates in this table are designed to produce highest economic yields when accompanied by good or above average management.

*** Excess application of potassium will lead to luxury consumption by the sugar beet plant. This has a negative effect upon clear juice purity.

HR, MR, LR, RR, and NR denote, respectively, high, medium, low, rare and no probabilities of profitable crop response to applied nutrient.

Nitrogen Requirements for Vegetables on Organic Soils

Cauliflower, broccoli and brussels sprouts - no print-out of N requirement; N to be recommended by specialist. Suggested maximum 130 kg N/ha with 70 kg/ha pre-plant and possible two sidedressings of 30 kg N/ha if required.

Cabbage - no print-out of N requirements; N to be recommended by specialist. Suggested maximum 100 kg N/ha -all pre-plant.

Potatoes - no print-out of N requirement; N to be recommended by specialist; suggested maximum 60 kg/ha.

Carrots - no N is required for carrots grown on established muck soils.

Parsnips - no print-out of N requirements. N to be recommended by specialist; suggested maximum 60 kg N/ha - all pre-plant.

Onions and garlic - no print-out of N requirements; N to be recommended by a specialist; suggested maximum 120 kg N/ha with 90 kg pre-plant and one sidedressing of 30 kg N/ha when plants are 8-10 cm high if rainfall has been above normal and soil temperatures below normal.

Lettuce and Endive - no print-out of N requirement; N to be recommended by specialist; suggested maximum 120 kg N/ha for early plantings, maximum 100 kg N/ha for mid season or late plantings - all pre-plant.

Spinach, radish, beet - no print-out of N requirement: N to be recommended by a specialist; suggested maximum 40 kg N/ha for radish and beet, 75 kg N/ha for spinach.

Celery - no print-out of N requirement; N to be recommended by a specialist; suggested maximum 160 kg/ha with 70 to 80 kg/ha pre-plant and remainder applied in 2 to 3 sidedressing of 40 kg/ha as required.

The fertilizer rates in this table are designed to produce highest economic yields when accompanied by good or above average management.

Phosphorus and Potassium Requirements - Vegetables on Organic Soils

Soil Phosphorus (0.5 M sodium bicarbonate extract) mg P L ⁻¹ of soil (ppm P)	Cabbage**, cauliflower, broccoli, brussels sprout, potato, carrot, parsnips, onion**, garlic, lettuce, spinach, radish, beet.	Celery	Soil Potassium (1 M ammonium acetate extract) mg K L ⁻¹ of soil (ppm K)	Cabbage**, cauliflower, broccoli, brussels sprouts, celery	Potato, carrot, parsnip, onion, garlic,	Potash (K ₂ O) required - kg/ha
			0-15	200 HR	230 HR	100 HR
0-3	100 HR	120 HR	10-15	190 HR	220 HR	100 HR
4-5	100 HR	120 HR	16-30	170 HR	210 HR	100 HR
6-7	100 HR	120 HR	31-45	150 HR	200 HR	90 HR
8-9	100 HR	120 HR	46-60	120 MR	170 MR	80 HR
10-12	90 MR	120 HR	61-80	120 MR	170 MR	60 MR
13-15	90 MR	110 MR	81-100	90 MR	150 MR	40 MR
16-20	80 MR	100 MR	101-120	70 MR	120 MR	30 MR
21-25	70 MR	90 MR	121-150	50 MR	80 MR	20 MR
26-30	60 MR	80 MR	151-180	40 MR	40 MR	20 MR
31-40	50 LR	70 LR	181-210	0 LR	0 LR	0 LR
41-50	30 LR	50 LR	211-250	0 RR	0 RR	0 RR
51-60	20 LR	40 LR	250+	0 NR*	0 NR*	0 NR*
61-80	0 RR	0 RR				
80+	0 NR*	0 NR*				

* adding nutrients to soils with these levels of nutrients may reduce crop yields or quality by interfering with the uptake of other nutrients.

** If no insecticide is used in the planting water, use a starter solution high in nitrogen such as 20-20-20 at 1 kg/200 L. Under high temperatures use 1/2 the fertilizer concentration.

*** If maturity of onions is a problem on organic soils less than 40 cm deep, additional phosphate may be required. The fertilizer rates in this table are designed to produce highest economic yields when accompanied by good or above average management.

HR, MR, LR, RR, and NR denote, respectively, high, medium, low, rare and no probabilities of profitable crop response to applied nutrient.