

## Nitrogen Requirements for Vegetables on Mineral Soils

CROPS		N REQUIRED kg N/ha
Potatoes	Expected Marketable Yield (t/ha)	
Main Crop	15	50
	20	75
	25	130
	30+	200
Early Crop		70
Garden - no print-out, adjust depending on species		60
Snap beans, lima beans, peas - with P <sub>2</sub> O <sub>5</sub> and K <sub>2</sub> O		15
- where no P <sub>2</sub> O <sub>5</sub> or K <sub>2</sub> O is required		0
Tomato* - no print-out; to be recommended by specialist.		
Fresh Market Tomatoes: -apply 35-50 kg N/ha preplant broadcast, and sidedress at first fruit set with 35-50 kg N/ha.		70-100
Processing Tomatoes: - apply N as preplant broadcast. -open pollinated varieties: 70-90 kg N/ha(with >2% soil organic matter), 100-120 kgN/ha(<2% organic matter). -hybrid varieties: 90-120 kg N/ha(>2% organic matter), 160-180 kg N/ha(<2% organic matter).		70-180
Fertigated Processing Tomatoes: - 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**

Phosphorus Requirement Table - Vegetables on Mineral Soils										Broccoli***, brussels sprout ***, cabbage***, cauliflower***, pepper, eggplant*** new or nursery planting of ginseng and asparagus
Soil Phosphorus (0.5 M sodium bicarbonate extract) mg P L <sup>-1</sup> of soil (ppm P)	Snap bean, lima bean, field bean, soybean, pea, established ginseng	Sweet corn, established asparagus	Sugar Beet	Rutabaga, beet, onion, spinach, lettuce, endive, garlic, chive, carrot, parsnip, horseradish	Potato, garden	Tomato**, cucumber, muskmelon, watermelon, pumpkin, squash	Celery, rhubarb			
	Radish			Phosphate (P <sub>2</sub> O <sub>5</sub> ) Required - kg/ha						
				180 HR	200 HR	230 HR	230 HR	230 HR	270 HR	
0-3	80 HR	110 HR	150 HR	180 HR	200 HR	230 HR	230 HR	230 HR	270 HR	
4-5	60 HR	100 HR	140 HR	170 HR	200 HR	230 HR	230 HR	230 HR	260 HR	
6-7	50 HR	90 HR	140 HR	170 HR	190 HR	220 HR	220 HR	220 HR	250 HR	
8-9	40 HR	70 HR	130 HR	160 HR	190 HR	220 HR	220 HR	220 HR	240 HR	
10-12	30 MR	50 HR	130 MR	160 HR	180 HR	210 HR	220 HR	220 HR	230 HR	
13-15	20 MR	20 MR	120 MR	150 HR	170 HR	190 HR	210 HR	210 HR	220 HR	
16-20	0 LR	20 MR	100 LR	140 HR	160 HR	170 HR	190 HR	190 HR	200 HR	
21-25	0 LR	20 LR	90 LR	120 MR	140 MR	140 MR	160 MR	160 MR	170 HR	
26-30	0 RR	20 LR	70 RR	100 MR	120 MR	110 MR	140 MR	140 MR	140 MR	
31-40	0 RR	0 RR	50 RR	80 MR	90 MR	80 MR	110 MR	110 MR	110 MR	
41-50	0 RR	0 RR	30 RR	50 LR	50 MR	50 MR	80 MR	80 MR	80 MR	
51-60	0 RR	0 RR	0 RR	30 LR	30 LR	30 LR	50 LR	50 LR	50 LR	
61-80	0 NR*	0 NR*	0 NR*	0 RR	30 LR (0 RR) <sup>†</sup>	0 RR	0 RR	0 RR	0 RR	
80+	0 NR*	0 NR*	0 NR*	0 NR*	30 LR (0 NR*) <sup>†</sup>	0 NR*	0 NR*	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.

**Potassium Requirement Table - Vegetables on Mineral Soils**

Soil Potassium (1 M ammonium acetate extract) mg K L <sup>-1</sup> of soil (ppm K)	Tomato(paste, Beet, onion, fresh market) spinach, Broccoli, Cucumber, lettuce, brussels muskmelon, endive, garlic, sprout, watermelon, chive, carrot, cabbage, pumpkin, horseradish, cauliflower, squash, parsnip, pepper, rutabaga** ginseng potato, garden eggplant										Asparagus (all plantings)	Tomato (whole pack)**		
	Snap bean, lima beans, field beans, soybeans, peas	Sweet corn	Sugar beet***	Radish	60 HR	120 HR	170 HR	180 HR	Potash (K <sub>2</sub> O) Required - kg/ha	230 HR			270 HR	
0-15					60 HR	120 HR	170 HR	180 HR	230 HR	230 HR	270 HR	340 HR	420 HR	660 HR
16-30					60 HR	110 HR	160 HR	170 HR	220 HR	220 HR	250 HR	330 HR	400 HR	640 HR
31-45					50 HR	90 HR	140 HR	160 HR	200 HR	210 HR	230 HR	310 HR	360 HR	600 HR
46-60					50 HR	80 HR	110 HR	140 HR	180 HR	190 HR	200 HR	280 HR	320 HR	560 HR
61-80					40 MR	60 MR	80 HR	120 HR	140 HR	160 HR	170 HR	250 HR	280 HR	480 HR
81-100					30 MR	40 MR	50 MR	90 MR	100 HR	130 HR	130 HR	200 HR	250 HR	400 HR
101-120					30 MR	30 MR	30 MR	70 MR	70 MR	100 MR	100 MR	150 MR	220 HR	340 MR
121-150					20 MR	0 LR	0 LR	20 MR	50 MR	80 MR	80 MR	90 MR	190 MR	300 MR
151-180					20 MR	0 RR	0 RR	0 LR	40 MR	50 MR	50 MR	50 MR	160 MR	280 MR
181-210					0 LR	0 RR	0 RR	0 LR	0 LR	0 LR	0 LR	0 LR	130 MR	140 MR
211-250					0 RR	0 RR	0 RR	0 RR	0 RR	0 RR	0 RR	0 RR	80 MR	70 MR
250+					0 NR*	0 NR*	0 NR*	0 NR*	0 NR*	0 NR*	0 NR*	0 NR*	0 LR	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 <sup>-1</sup> of soil (ppm P)	Cabbage**, cauliflower, broccoli, brussels sprout, potato, carrot, parsnips, onion***, garlic, lettuce, spinach, radish, beet.	Soil Potassium (1 M ammonium acetate extract) mg K L <sup>-1</sup> of soil (ppm K)	Cabbage**, cauliflower, broccoli, brussels sprouts, celery garlic, Potato, carrot, parsnip, onion, spinach, radish, beet
	Phosphate (P <sub>2</sub> O <sub>5</sub> ) required –kg/ha		Potash (K <sub>2</sub> O) required – kg/ha
0-3	100 HR	0-15	200 HR 230 HR 100 HR
4-5	100 HR	16-30	190 HR 220 HR 100 HR
6-7	100 HR	31-45	170 HR 210 HR 90 HR
8-9	100 HR	46-60	150 HR 200 HR 80 HR
10-12	90 MR	61-80	120 MR 170 MR 60 MR
13-15	90 MR	81-100	90 MR 150 MR 40 MR
16-20	80 MR	101-120	70 MR 120 MR 30 MR
21-25	70 MR	121-150	50 MR 80 MR 20 MR
26-30	60 MR	151-180	40 MR 40 MR 20 MR
31-40	50 LR	181-210	0 LR 0 LR 0 LR
41-50	30 LR	211-250	0 RR 0 RR 0 RR
51-60	20 LR	250+	0 NR* 0 NR* 0 NR*
61-80	0RR		
80+	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.