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Moore, F. D./Fertilizing the home vegetable garden**Fertilizing
the home
vegetable garden**Frank D. Moore^{1/}

no. 7.611

COLORADO STATE UNIVERSITY EXTENSION SERVICE

Quick Facts

- Soils which grow weeds should produce good gardens.
- Low analysis fertilizers, 10 to 20 pounds per 1,000 square feet (4.5 to 9.1 kilograms per 90 square meters), may be added to gardens each year.
- Horse or cow manure may be incorporated into soil at rates of up to 900 pounds per 1,000 square feet (408 kg per 90 sq m) in the fall.
- Starter solutions high in phosphate should be added when setting transplants.
- Most Colorado soils do not need potash.
- The use of lawn clippings containing pesticides should be avoided on vegetables or in composting.
- The use of lawn fertilizers containing herbicides should be avoided.
- Soil should be tested to avoid problems.

A soil that will grow a good crop of weeds, other than alkali or salt weeds, can be made into a fine garden. The soil must have good subdrainage. A heavy clay soil would not be a good first choice. Level land or land that gently slopes to the south or southeast should be selected for the vegetable garden. Full sunlight exposure is desired.

Relatively high levels of soil nutrients are necessary for successful vegetable production. The nutrient level can be maintained by adding mineral fertilizers, organic materials or a combination of both. A soil test will not only determine nutrient elements to add, but warn of excess levels of nutrients and salts which are harmful to plants.

Mineral Fertilizers

All commercial fertilizers are labeled uniformly. There are three figures: the first indicates the percentage of elemental nitrogen (N), the second the percentage of available phosphate (P_2O_5), and the third the percentage of water-soluble potash (K_2O). For example, 50 pounds (22.5 kilograms) of (5-10-5) fertilizer contains 2.5 pounds (1.1 kg) of nitrogen, 5 pounds (2.3 kg) of phosphate, and 2.5 pounds (1.1 kg) of potash.

As a rule of thumb, 10 to 20 pounds (4.5 to 9.1 kg) of low analysis complete mineral fertilizer (5-10-5, 6-10-4, etc.) may be added to 1,000 square feet (90 square meters) of garden area each year. Most Colorado soils do not require potash, however. If high analysis

fertilizers are used on a potash sufficient soil, an application could be made of 10 pounds (4.5 kg) of superphosphate [0-(16 to 20)-0] or 5 pounds (2.3 kg) of treble superphosphate [0-(42 to 47)-0] or 5 pounds (2.3 kg) of ammonium phosphate (11-48-9) per 1,000 square feet (90 sq m).

Nitrogen may be supplied by working manure in with the phosphate fertilizers. In conjunction with the phosphate fertilizer, urea, ammonium sulfate or ammonium nitrate may be used at rates to give one pound (.5 kg) of nitrogen per 1,000 square feet (90 sq m). Mineral fertilizers may be worked into the soil in the fall or spring. Phosphate and potash need not be applied after planting. Post-planting applications of nitrogen fertilizers on fruit-bearing crops such as tomatoes and strawberries may stimulate vegetative growth and reduce yield. Starter solutions high in phosphate may be used to advantage when setting transplants.

Organic Fertilizers

When organic materials are available, they should be worked deeply into the soil in the fall of the year. Horse and cow manure may be used at rates of up to 900 pounds per 1,000 square feet (408 kg per 90 sq m). Not more than one-fourth of this amount of sheep, rabbit or poultry manure should be used. The nutrient quality of barnyard manure and compost can be improved by adding $\frac{1}{4}$ pound (113 grams) of superphosphate to each bushel (.04 cubic meter) of material. The average farm manure as drawn to the field contains about 10 pounds (4.5 kg) each of nitrogen and potash as well as 5 pounds (2.3 kg) of phosphate per ton (907 kg).

Fresh sawdust or sawmill woodwaste may be used as a soil amendment in order to improve the tilth of most Colorado soils, however, composted organic materials are better. If undecomposed materials are used, such as those found in Table 3, the appropriate nitrogen recommendations which have been included should be followed.

The use of lawn clippings containing pesticides should be avoided on vegetables or for composting. Lawn fertilizers may contain herbicides and, therefore, should not be used on vegetable gardens.

References

Selecting Fertilizers for Lawns and Gardens, Home and Garden Bulletin No. 89, Soil and Water Conservation Research Division, Agricultural Research Service, USDA.

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Table 1: Example of fertilizers for vegetable garden soils which do require potash.

Previous fertilizer applied	Fertilizer to apply				Approximate amount of nutrients
	Analysis	Rate lb/1,000 sq ft (kg/90 sq m)	N	P ₂ O ₅ lb/1,000 sq ft (kg/90 sq m)	K ₂ O
Little or none	3-13-13	40 lbs (18.1 kg)	1.2 lbs (.5 kg)	4.8 lbs (2.2 kg)	4.8 lbs (2.2 kg)
Some	5-10-10	25 lbs (11.3 kg)	1.2 lbs (.5 kg)	2.5 lbs (1.1 kg)	2.5 lbs (1.1 kg)
Heavy	10-10-10	12 lbs (5.4 kg)	1.2 lbs (.5 kg)	1.2 lbs (.5 kg)	1.2 lbs (.5 kg)

Table 2: Approximate composition of organic fertilizers.*

Fertilizer	Per cent composition		
	N	P ₂ O ₅	K ₂ O
Cow manure	0.5-2.0	0.2-0.9	0.5-1.5
Horse manure	0.5-2.5	0.3-2.5	0.5-3.0
Sheep manure	1.0-4.0	1.0-2.5	1.0-3.0
Rabbit manure, dry	2.3	1.4	0.8
Poultry manure	1.1-6.0	0.5-4.0	0.5-3.0
Dried blood	12.0-14.5	0.4-1.5	0.6
Hog manure	0.3-0.5	0.2-0.4	0.4-0.5
Activated heat-treated sludge	2.0-6.0	3.0-7.0	0 -1.0

*Actual per cent composition depends upon moisture content, bedding and/or litter materials.

Table 3: Amount of nitrogen (N) required for decomposition of organic materials.

Material	Amount of N required lbs N/ton (kg/907 kg) of organic matter
Corn cobs, ground	22.5 lbs (10.2 kg)
Hay	7.6 lbs (3.4 kg)
Sawdust, fresh	26.0 lbs (11.8 kg)
Cereal straw	17.6 lbs (7.9 kg)
Grass clippings	4.0 lbs (1.8 kg)

Table 4: Amounts of fertilizer required to supply the nitrogen (N) needed to decompose fresh sawdust.*

Fertilizer	Amount needed to decompose 1 bushel of sawdust
	lbs (kgs)
Urea (45.0% N)	0.6 (.3)
Ammonium nitrate (33.5% N)	0.8 (.4)
Ammonium sulfate (21.0% N)	1.2 (.5)
10-10-10 or 10-6-4 (10.0% N)	2.7 (1.2)
6-10-4 (6.0% N)	5.0 (2.3)

*Incorporate not more than 2 inches (5.1 centimeters) of sawdust, 6 to 8 inches (15.2 to 20.3 cm) deep, per year. Do not use black walnut or cedar sawdust.