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FRUITS & VEGETABLES

Fertilizing the Vegetable Garden

no. 7.611

by F.D. Moore¹

Quick Facts...

Soils that grow weeds should produce good gardens.

Low analysis fertilizers, 10 to 20 pounds per 1,000 square feet, may be added to gardens each year, assuming low soil salt levels.

Well-aged horse or cow manure may be incorporated into soil in the fall at rates of up to 900 pounds per 1,000 square feet.

Do not use fresh manure in food gardens.

Don't use lawn clippings containing pesticides on vegetables or in composting.

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 is not a good choice. Select level land or land that gently slopes to the south or southeast. Full sunlight exposure is desired.

Relatively high levels of soil nutrients are necessary for successful vegetable production. Maintain the nutrient level by adding mineral fertilizers, organic materials or both. A soil test will determine which nutrients to add, and also warn of excess levels of nutrients and salts that may harm plants.

Mineral Fertilizers

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

As a rule, 10 to 20 pounds of low-analysis complete mineral fertilizer (5-10-5, 6-10-4, etc.), may be added to 1,000 square feet of garden area each year. Most Colorado soils do not require potash. If high-analysis fertilizers are used on a potash-sufficient soil, apply 10 pounds of superphosphate [0-(16 to 20)-0] or 5 pounds of treble superphosphate [0-(42 to 47)-0] or 5 pounds of ammonium phosphate (11-48-9) per 1,000 square feet.

Supply nitrogen by working well-aged manure in with the phosphate fertilizers. **Never use fresh manure in food gardens!** Urea, ammonium sulfate or ammonium nitrate may be used at rates to give 1 pound of nitrogen per 1,000 square feet. Work mineral fertilizers into the soil in the fall or spring. Phosphate and potash do not need to be applied after planting. Post-planting applications of nitrogen 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, work them deeply into the soil in the fall of the year. Use aged horse and cow manure at rates of up to 900 pounds per 1,000 square feet. Use no more than one-fourth of this amount of aged sheep, rabbit or poultry manure. The nutrient quality of barnyard manure and compost can be improved by adding 1/4 pound of superphosphate to each bushel of material. The average farm manure as drawn to the field contains about 10 pounds each of nitrogen and potash as well as 5 pounds of phosphate per ton.

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

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Do not use lawn clippings containing pesticides on vegetables or for composting. Lawn fertilizers may contain herbicides. Therefore, do not use them 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.

Composting Yard Waste, *Colorado State University Cooperative Extension, fact sheet 7.212*.

Zinc Deficiency of Field and Vegetable Crops in the West, *USDA Leaflet No. 495*.

Organic gardening, *Colorado State University Cooperative Extension, Bulletin 486A*.

Salt-Affected Soils, *Colorado State University Cooperative Extension, fact sheet 0.503*.

materials are better. If undecomposed materials are used, such as those found in Table 3, follow the appropriate nitrogen recommendations in the table.

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

| Previous fertilizer-applied nutrients | Fertilizer to apply Analysis | Rate | Approximate amount of | | |
|---------------------------------------|------------------------------|--------|-----------------------|-------------------------------|------------------|
| | | | N | P ₂ O ₅ | K ₂ O |
| | | | lb/1,000 sq ft | | |
| Little or none | 3-13-13 | 40 lbs | 1.2 lbs | 4.8 lbs | 4.8 lbs |
| Some | 5-10-10 | 25 lbs | 1.2 lbs | 2.5 lbs | 2.5 lbs |
| Heavy | 10-10-10 | 12 lbs | 1.2 lbs | 1.2 lbs | 1.2 lbs |

Table 2: Approximate composition of organic fertilizers.*

| Fertilizer | Percent 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 percent 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 of organic matter |
|-------------------|--|
| Corn cobs, ground | 22.5 lbs |
| Hay | 7.6 lbs |
| Sawdust, fresh | 26.0 lbs |
| Cereal straw | 17.6 lbs |
| Grass clippings | 4.0 lbs |

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 |
| Urea (45.0% N) | 0.8 |
| Ammonium nitrate (33.5% N) | 0.8 |
| Ammonium sulfate (21.0% N) | 1.2 |
| 10-10-10 or 10-6-4 (10.0% N) | 2.7 |
| 6-10-4 (6.0% N) | 5.0 |

*Incorporate not more than 2 inches of sawdust, 6 to 8 inches deep, per year. Do not use black walnut or cedar sawdust.

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