Circular 448

Improving Garden Soil Fertility

OKLAHOMA A&M COLLEGE
DIVISION OF AGRICULTURE
SCIENCE SERVING AGRICULTURE
EXTENSION SERVICE

IMPROVING GARDEN SOIL FERTILITY

by

E. L. Whitehead, Extension Horticulturist

Building Soil Fertility

Fresh vegetables are an excellent source of the vitamins and minerals essential to good health. The necessary mineral fertilizer can be applied when the soil is prepared, or at planting time. A garden soil well supplied with organic matter, lime and phosphorus will, under favorable conditions, produce a good yield of vegetables which are high in quality and nutritional value.

Of first consideration in building garden soils is organic matter. Organic material is of value because it keeps soils in a friable condition. is food for the necessary beneficial soil organisms, and has an important role in relation to the available supply of other plant food elements in soils. Organic matter supplies nitrogen, increases the water-holding capacity of the soil, and aids in preventing erosion by wind and water. In order to use commercial fertilizers to best advantage, the organic content of soils must be maintained at a high level. This means adding some form of organic matter each year is a good garden practice.

Barnyard Manure

Barnyard manure is a good source of organic matter for the garden, since the area is small as compared to other fields on the farm. The earlier the application is made in the fall, the heavier and coarser the material may be. In eastern counties, applications from 8 to 10 tons per acre will not be too large. In western counties, 4 to 6 tons per acre may be used. In the case of late applications, partially decomposed materials should be used. Pile the manure and allow it to decompose before spreading it on the garden plot in the spring.

Since manure is not a balanced fertilizer, use superphosphate along with it at the rate of from 300 to 500 pounds per acre. It may be broadcast separately or applied along with the manure.

Since vegetable crops as a group prefer slightly acid soils, the amount of lime used should be determined by a soil test. As a general

rule it is desirable to use only about one-half the amount of lime needed to grow alfalfa. If ground limestone is not available, gardeners may use hydrated lime at ⅔ the rate of limestone, provided it is spread during the winter months. **Do not use lime on the potato patch.**

Plowing Improves Soil

Plowing is an important item in the garden soil improvement program. Soils subject to blowing may be listed and left in ridges, or plowed before the manure and phosphate are added. Soils turned before the first of the year should be plowed to a depth of 8 inches. Plowing after January 1 should be shallow in order that a firmer seed bed can be prepared.

In addition to the use of barnyard manure to add organic matter, any composted vegetative material such as leaves, cotton burrs, hay or straw will do. Poultry manure is high in nitrogen and a good source of organic matter for the garden soil.

To make compost any vegetative material may be used. The material to be composted should be piled in layers about a foot deep and covered with a layer of soil 4 to 6 inches in depth. These piles may be round and the top kept saucer shaped in order to catch plenty of moisture. For best results the fresh compost pile should be about 4 feet high. To hasten decomposition during periods when rainfall is lacking, a thorough soaking every 5 or 6 days will prove helpful. Leaves should not be overlooked as a source of organic matter. Composted materials can either be spread in the same manner as manure or used as a mulch around growing crops.

Green Manure

Green manure crops are an excellent source of organic matter. Many home gardens are too large and might well be turned into a two-plot affair, using one half of the area for vegetables and devoting the other half to soil improvement crops. In the case of annuals, seed hairy vetch during September and plow it under the next May. Follow the vetch with a crop of cowpeas to be plowed under early in the fall, or use this space for fall gardening. In a two-year rotation the soil improvement crop may be sweet clover. In this case seed it in the spring and leave it for two seasons. Weeds should be controlled the first year until the clover has become established. All legume seeds should be inoculated. Make the necessary applications of lime and phosphate before the legumes are planted.

Commercial Fertilizer

The use of commercial fertilizers is increasing in Oklahoma. Their use on vegetable crops is especially desirable in the eastern part of the state, and in western areas where irrigation facilities are available. Commercial fertilizers should be regarded as an aid in the general soil improvement program. Use a 5-10-5 or its equivalent analysis on vegetable crops, and apply at the rate of about 500 pounds per acre, which is about 4 pounds per 100 foot row. The fertilizer may be spread broadcast over the whole garden just before the seedbed is put in shape for planting in the spring, or may be distributed in the row just before the seed is planted. In row application the fertilizer must be mixed with the soil to prevent damage to seeds or roots of the young plants.

Soil improvement program for the garden summed up.

1. Test garden soils.
2. Apply superphosphate if needed. (See Ext. Cir. 627)
3. Make a heavy annual application of barnyard manure, poultry manure, compost or other organic material in the fall.
4. Disc manure and phosphate into the topsoil.
5. Plow or list in the fall, depending on nature of the soil.
6. Use commercial fertilizer, at rate of about 500 pounds per acre. About 100 pounds per average garden.
7. Special soil improvement practices include late application of well rotted manure or other composted material, and use of legume green manure crops in two-plot garden rotation instead of manure.
8. Supply nitrogen as a side dressing to leafy vegetables and corn.

Cooperative Extension Work in Agriculture and Home Economics, Oklahoma Agricultural and Mechanical College and United States Department of Agriculture, Cooperating. Shawnee Brown, Director, Oklahoma Agricultural Extension Service, Stillwater, Oklahoma. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914.