

Soil Preparation And Liming¹

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Probably the most physical part of vegetable gardening is preparing the soil for planting. On large gardens, mechanical equipment such as a rototiller or tractor-drawn plow often is necessary, and even the hiring of such equipment or the job itself may be practical. However, on smaller gardens the task can be accomplished with a spade, spading fork or shovel. Much depends on the type of roots and vegetation that must be removed.

Turn the ground about three weeks before planting when the soil is dry enough to work. Turn the soil completely over when spading. "Double-digging" is practiced by many gardeners in order to prepare a deeper root zone. To "double-dig", first shovel off a 12-inch layer of soil, turn the bottom 12-inch layer, then replace the topsoil.

Weeds, cover crops and added organic matter such as compost and animal manure may all be spaded under at the same time. Sufficient time must be allowed for the freshly turned-under organic material to decompose and become fairly well-rotted before seeds are planted. Woody plant materials such as roots, sticks, and dried dog-fennel stalks are best removed from the garden rather than cut into the soil. Likewise, perennial grass and weed pests should be

removed whenever possible to eliminate recurring problems.

Break all clods and level with a rake, or harrow the soil soon after turning to maintain good soil texture and prevent excessive drying. For small-seeded crops such as carrots, and all crops to a certain extent, a finely pulverized surface insures easier planting, better germination and a more even stand. A plank drag may be used to fit the soil for planting on larger gardens. A hand rake may serve the same purpose in smaller plots.

SOIL REACTION AND LIME

In many gardens, soil preparation includes the application of a liming material where a soil test shows it to be needed.

Most vegetables grow best on a soil that has a pH between 5.8 and 6.3 (or slightly acid). The symbol 'pH' and the figures accompanying it are used to express the degree of soil acidity. A soil with a pH of 7.0 is neutral, while one with a pH of 6.9 or below is acid or "sour", and one with a pH of 7.1 or above is alkaline or "sweet".

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Proper applications of lime made to extremely acid soils will increase the production of most vegetables. The main functions of lime are to reduce soil acidity, to supply nutrients, mainly calcium, to the soil, and to bring micronutrients into usable form. A well-limed soil helps to avoid such problems as blossom-end rot of tomatoes which is related to an inadequate calcium supply. Apply liming materials only if a soil test indicates a need for them. Your county Cooperative Extension agent can assist you in having your soil tested by providing directions and an inexpensive soil-test kit. The old adage, "Don't guess, soil test!" has true meaning.

Too much lime in the soil may be just as bad as too little. Where soils are highly alkaline, special attention must be paid to the inclusion of minor elements in the fertilizer mixes. Sulfur is suggested to reduce alkalinity on over-limed soils. Generally, 1-2 pounds per 100 sq ft. is adequate. However, on soils with a native pH of over 7.0, applying sulfur is of little benefit.

Liming materials and the amount to apply depend upon the soil reaction (pH) and the type soil, among other things. Often it is necessary to consult a technical advisor to determine the proper liming program for your garden soil. But in general, a reaction below pH 5.5 indicates a need for lime, and 2-3 pounds of dolomitic lime per 100 square feet is a fairly effective application to start a remedial program.

Agricultural limestone, which contains mostly calcium carbonate may be used. However, dolomite is a good liming material due to its magnesium content. Owing to its relatively slow reaction, it should be applied well ahead of planting (two to three months). Hydrated lime may be used where a quick acting material is required. It may be applied two weeks or more before planting provided it is mixed well with the soil. Use at three-fourths the above rate for dolomite.

The lime should be spread evenly over the garden before plowing or spading it into the soil to a depth of six inches. Then water the soil to promote the chemical reaction.

When a soil test has established a need for liming, lime may be applied close to planting (a day or two) without detriment; however, it will be several weeks before the benefits of the liming will become effective.

OTHER CONSIDERATIONS AT SOIL PREPARATION TIME

Fertilizing — While preparing the soil for planting, you will need to consider the fertilizer needs of the soil and plants. Refer to IFAS Fact Sheet HS-505, "Fertilizing the Garden", and to IFAS Fact Sheet EES-327 "Organic Fertilizers and Soil Amendments".

Bedding — Elevated soil beds may be needed where puddling or flooding might cause root damage. Also beds often are beneficial to such root crops as carrots and potatoes. Otherwise, it may be advantageous to plant seeds on a level surface to insure moisture in the root zone. Where beds are needed, they can be constructed with a hoe, wheel plow or garden tractor, in multiple rows, or in raised 4 foot wide beds. Usually, a bed height of 6 to 8 inches is sufficient.

Hide-row borders — Wood and other materials such as plastic and concrete are often used to confine the soil within a wide-row system. Treated lumber, which resists decay, may be used with vegetables, although many organic gardeners refrain from using it due to a concern that the preservative may be harmful to health. There have been no conclusive studies to show that treated lumber poses any real danger.