



GUIDE TO IMPROVE GARDEN CROP YIELDS AND SOIL FERTILITY

Your request form mentions that you have trouble growing healthy and producing crops. There are several factors which can cause poor growth, some of which cannot be explained by chemical analysis of a small sample of soil. But let me try to discuss some common causes and solutions.

For best performance, garden crops need plenty of light (sun energy), space for roots to grow deep without major physical obstruction (e.g., bedrock, hardpan, water table), and an adequate supply of water and nutrients. You control light by choosing a location where sunlight can hit the leaves all day long. You can control rooting space by carefully preparing the soil's top 6 to 12 inches during the Fall prior to the growing season, usually by hand-spading (small plots) or disking (large fields). Frequent use of roto-tillers can create hardpans that may obstruct root growth, and they can damage soil structure. Fall-time spading or disking, possibly followed by a winter cover crop or by surface mulching, permits the formation of natural soil structure during the wetting and freezing cycles of our winters. In some soils with high clay content, it pays to use a heavy fork to loosen (not turn) the soil layer below 12 inches of depth so as to ensure adequate space for deep-rooting crops. In Spring, the cover crop is spaded or disked into the surface soil. If mulch is used, remove it prior to planting.

To assess soil fertility, always test soils in late Fall. Follow the fertility instructions by applying recommended lime and/or fertilizer when you spade or disk the soil in preparation for winter. Summer gardening really starts in the previous Fall! There is no need to re-test or re-fertilize soils in Spring if you did it the previous Fall. The only nutrient to which crops may respond is nitrogen (the first number on the fertilizer bag) especially if your soil still lacks organic matter. This response is mostly true for crops which are grown for their leaves, which often benefit from periodic small applications of (preferably soluble) nitrogen (N) during the growing season. If seed and fruit crops get too much N, you may have mostly leaves and no fruit. Such crops benefit more from adequate phosphorus (P). We do not test for N but if your test results show a high P level, you will probably also have an adequate level of N for most crops. Legumes, root crops and woody crops (e.g., berries) benefit from adequate potassium (K) but there is usually plenty K in our soils. Where magnesium (Mg) is lacking, it can be supplied as dolomite lime (instead of using regular agricultural or calcitic lime).

Fertility control starts with pH or acidity control. Try to bring your soil pH to 6.2-6.5 but no higher. We see more crop disease problems in over-limed soils than in acid soils! It takes time to make lime raise your pH but also to lower it, so follow fertility instructions. Use animal manures in moderation since some types have a high salt content. Same advice for fireplace ashes! Do not use sewage sludge unless you are sure that it has been heat-treated by composting. Always correct pH in the Fall by mixing the recommended lime into the topsoil. Be aware that root crops prefer lower pH levels

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