

AMENDING SANDY, GRAVELLY OR CLAYEY SOILS TO GROW A LAWN

Introduction: Lawn grasses are no different than most shrubs and trees in that they all grow best in a fertile, well-drained loam that has a fair degree of moisture holding ability. A soil with a very sandy texture holds only small amounts of water and nutrients, since there is a lack of clay and silt particles, which have better water and nutrient holding abilities. Sandy soil is like a mass of tiny stones, allowing water to drain quickly. Most plants, including lawn grasses, do not grow well in these droughty, low-fertility conditions.

Conversely, soils with high clay content may hold too much water and therefore lack adequate drainage. If too much water is retained, the oxygen content of the soil decreases, and plant roots suffocate. Clay soils also add to the problem of compaction. Compaction occurs when the tiny clay particles become too closely packed together. Compaction also decreases soil oxygen, and roots have difficulty physically penetrating a compacted clay soil.

While a few plant species exist which will grow well in soils with high sand or clay content, most plants, including lawn grass species, will perform much better if these difficult soils are amended before planting.

How to improve difficult soils: The best way to improve a very sandy or gravelly soil for a lawn is to work organic matter and topsoil into it. These amendments must be mixed thoroughly with at least the top 4 inches of existing soil, and more deeply if possible. While organic matter or topsoil could be used alone, a sandy or gravelly soil is improved more if you add both organic matter and topsoil than if you add either material alone. Organic matter is depleted by microbial activity over time, while topsoil will be a more permanent amendment. However, be especially cautious in adding a clayey topsoil to sand, since the result can resemble concrete!

In the case of a soil with high clay content, adding organic matter is usually more important than adding topsoil. Incorporate the organic matter into at least the top 4 inches of soil.

Extreme care is needed when buying topsoil. There are no regulations about the actual content of topsoil, hence many different materials are called topsoil in the landscape and building trades. Some "topsoils" have been found to contain excessive amounts of stones, clay, sand, wood, demolition debris, or other undesirable matter. Always inspect topsoil before you buy it. Insist on an accurate sample if you buy topsoil from someone who will deliver it for you. If a slightly moist sample of the topsoil seems adequate to make clay pots from, it is probably too high in clay. If it is extremely gritty, then it contains too much sand. Stones and other larger debris should be apparent by visual inspection. If possible, be on-site when the topsoil is delivered, so that a load can be rejected if it is not the same as the sample material you previously inspected.

There are several sources of organic matter. Peat moss, composted animal manure, composted leaves and yard waste, and composted brewery waste are just some of the materials available. Again, an inspection of organic matter before purchase is recommended, especially when a large load is to be delivered by truck to your site.

If you have a difficult soil but already have planted a lawn, topdressing with compost may provide some improvement in the soil. Topdressing is defined as spreading a thin layer of material over the surface of a lawn. For home lawns, topdressing 1/4 of an inch of compost in spring and fall may improve soil conditions.

Topdressing can be done with homeowner-type drop spreaders, but a fine compost with few large bits or lumps must be selected. If topdressing is combined with core cultivation (a practice which involves removing plugs of soil from the lawn), the results will probably be even better. See our separate fact sheet on aeration/core cultivation of lawn areas.

How much topsoil or compost do I need to buy?

Two inches of compost and/or topsoil is needed to begin to amend a very difficult soil, with three or four inches even better. Although large amounts of compost and topsoil can be expensive, a lawn is a long-term investment, so try to purchase as much as your budget allows. Follow the chart below in order to know how much material to obtain.

Cubic Yards Of Compost Or Topsoil Needed

Inches of compost or topsoil you want to apply

Area to be amended (in square feet)	1/4	1/2	1	2	3	4
100	0.08	0.16	0.32	0.62	0.92	1.24
1,000	0.8	1.6	3.2	6.2	9.2	12.4
5,000	4	8	16	31	46	62
10,000	8	16	32	62	92	124
15,000	12	24	48	93	138	186
20,000	16	32	64	123	184	248

* Some values are rounded to a whole number

For anything but the smallest areas, buying topsoil or compost in bulk makes the most sense. A large bale of peat moss contains about 7.5 cubic feet of material, so about 3 1/2 bales of peat are needed to make one cubic yard of peat.

The above chart was composed using the following formula:

$$\frac{\text{Area to be amended (in square feet)} \times \text{Inches of material you want to apply}}{27 \text{ cubic feet}} = \text{Cubic yards of material needed}$$

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Based on "Preparing Very Sandy Soils For Growing Lawns," (original source unknown), and "Calculating Compost Capacity" from the December 1993 edition of Lawn and Landscape Maintenance.