

YOUR TURF PROBLEMS

... and their solution

Is lack of phosphoric acid the sole cause of shallow roots on greens? We are advised to use phosphate in quantity to induce deeper root formation.

QUESTION:

ANSWER:

No; phosphoric acid deficiency is not the sole or even the major cause of shallow roots. Undue emphasis results from its startling effect on initial root formation from seed because of small size. All grass seed contains very little stored food, so immediately after germination seedlings must forage for needed food. Hence a high level of soil fertility (particularly phosphoric acid) is the secret of quick turf development from seed. But on established turf the effect is less striking because a more extensive root system enables plants to forage for needed food.

In the order named, root depth depends upon (1) soil texture, (2) type of grass and character of growth, (3) watering practices, (4) soil reaction, and (5) available soil nutrients.

(1) Usually soil is too heavy and compact, so of necessity roots stay near the surface to obtain needed oxygen. A medium sandy loam, containing an adequate quantity of organic matter is best. It should extend to a depth of 4 to 8 inches, or more. This type soil can be made from appropriate quantities of good loam, sharp sand, and organic matter (either manure compost, leaf mold, or peat humus).

To improve soil on established greens, either lift existing turf and modify underlying soil, or build suitable soil by frequent light top-dressings. Straight dressings of sand or humus do not modify compact soil. Both materials form distinct layers and thus further restrict root development.

(2) Type of grass and character of growth are important also. Under close cutting, poa annua develops shallower roots than many bents. Even the latter differ in rooting habits. When turf is allowed to develop a thick, dense surface mat, roots become shallow because penetration of applied water is impeded. Removal

of surplus grass by alternate raking and mowing is the obvious solution. This is best done in early spring or early fall, but should not be attempted during hot weather.

(3) Over-watering always encourages shallow root development. Water, beyond the quantity needed to produce capillary films, displaces soil air. This reduces oxygen supply, so only surface roots survive.

Superficial sprinkling also restricts roots, by depriving deeper roots of needed moisture. These roots disappear as soil becomes depleted of moisture. Uniform soil moisture content throughout the area of root development is an absolute necessity.

With a deep root system, favorable soil texture, and satisfactory drainage, thorough watering at appropriate intervals is best practice.

Nevertheless, failure to recognize exceptions to this general axiom has resulted in serious turf loss. Even under ideal conditions, roots are shallower in summer than in spring or fall. Prolonged down-pouring rains may further restrict roots sometimes, confining them to the surface inch of soil. Then daily hand-syringing becomes necessary to maintain the surface moisture supply. On hot windy days, wilting may occur by mid-afternoon, even though greens received water during the previous night. Unless surface moisture is restored promptly, turf loss may occur.

(4) Extreme soil acidity favors shallow root development. Where soil tests medium to strongly acid, the moderate use of lime is justified.

(5) When the factors enumerated are favorable, soil nutrient substances become important. Although phosphoric acid is needed, an adequate quantity of nitrogen and other essential elements is equally important.

Root systems can be improved only by eliminating all unfavorable factors.

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