Material	Availability of Nitrogen	Period of influence in number of days after application		
		Start	Peak	End
Ammonia	90	3	6-9	16
Ammo-Phos	90	5	8-12	18
Bone Meal (steamed)	25	20	30-35	45
Castor bean pomace	70	9	25-28	42
Cottonseed meal	70	7	18-22	35
Calcium Cyanamid	90	10	14-18	25
Dried blood	80	5	8-10	22
Fish (ground)	70	7	12-16	30
Guano	70	8	14-18	30
Garbage tankage	30	22	30-35	42
Hoofard Horn meal	60	18	30-35	50
Manures, dried	60	12	17-22	35
Milorganite	80	5	12-15	40
Nitrates	100	1	4-8	15
Poultry Manure	70	5	10-14	25
Soybean meal	70	20	28-32	40
Tankage, High grade	70	10	14-18	40
Tankage, Low grade	30	20	30-35	45
Urea	90	8	12-15	25

guaranteed available nitrogen can be made ready for plant use within a reasonable time. The remainder of 30% is not lost, but made available in small quantities over a considerable period of time.

Obviously there are many factors that control the availability and duration of the effectiveness of fertilizers when applied to the soil, more especially so in the case of top-dressing as is usually practiced in turf culture. The above table is arranged with the assumption that each fertilizer is used under similar soil conditions.

WEED PROBLEM OF TURF

By HOWARD B. SPRAGUE

Weeds are plants growing where they are not planted. They are frequently more aggressive than turf plants. According to length of life, weeds are:

Annuals, which complete growth in one year and produce seed abundantly. Examples: Crab grass, goose grass, foxtail grass, knotweed, chickweed, panic grass.

Biennials, which require two seasons to complete growth; the first being used to manufacture and store food for the production of flowers with the formation of seeds in the second. Examples: Common thistle, wild carrot.

Perennials, which live more than two seasons; usually begin forming seed by the second season. The most troublesome perennials have creeping, rooting stems which contain stored food and send up new shoots. Examples: Dandelions, plantain, poison ivy, field sorrel.

Sources of Weed Seed:

a. Carried by wind, drainage water, and animals, including man.
b. Introduced in fresh or partly-rotted manure.
c. Added in top-soil used for topdressings, or carelessly managed compost piles.
d. Present in seeding mixtures, particularly cheap seed.
e. Produced by weeds in turf, in spite of close mowing.

Control of Weeds:

a. Remove sources of weed seeds; bake or steam topdressing to kill weed seeds, or purchase topdressing that carries no weed seed.
b. Maintain turf in vigorous condition to prevent weeds from obtaining a foothold. Proper liming, fertilization, mowing, watering and rolling are very effective.
c. Close mowing kills many types of weeds; prevention of seed formation in the fairways and the rough by mowing also aids.
d. Use of chemicals, as sprays, or in topdressing (such as lead arsenate).

Some Troublesome Turf Weeds:

Crab Grass—Warm season annual, spreads by seed. Hand weed greens in June and July. Use lead arsenate in topdressings and keep turf vigorous, particularly in early spring and summer. Time-

ly fertilization and careful watering are very effective on lawns.

Chickweed—Dust plants with ammonium sulphate or ammo-phos, water thoroughly as soon as weeds turn brown, remove dead plants, and reseed.

White Clover—Stimulated by potash and phosphorus fertilizers. Undesirable only on fine turf. Largely controlled by careful nitrogen fertilization of the grass, and the use of aggressive strains of grass. It may be controlled temporarily by burning, as for chickweed.

Silver Crab Grass (Goose grass)—Warm season annual, spreads by seed only. Hand weeding in June and July. Same treatment as for crab grass.

Poa Annua—Very difficult to control. Keep soil moderately dry and well drained, and maintain vigor of the turf by proper treatment. Use lead arsenate in topdressing. Hand weeding is the only method practicable for complete control and this is very expensive. Add new seed of desirable grasses in August or September, to compete with seedlings of Poa Annua.

Foxtail Grass—Warm season annual, spreads by seed. Hand weed fine turf in June and July. Prevent seed formation on lawns and fairways by close mowing wherever seed heads are formed. Follow same treatment as that recommended for crab grass.

Stink Grass—Same as for crab grass.

Yarrow—Perennials spreading by root stocks. When closely mowed, sometimes makes fine turf. To control, remove all turf and soil to a depth of 3 inches, fill in with clean soil, and sod or replant. Complete sterilization of soil with chlorate weed killers is also effective.

Plantain—Perennials without creeping stems. Hand weed or poison each individual plant with sulphuric acid or kerosene. If very abundant try spraying with iron sulphate solution (2 lbs. per gal.) after bruising leaves with suitable implement.

Dandelion—Same as for plantain. Spray with iron sulphate solution after mowing and bruising leaves with some suitable implement.

Poison Ivy—Perennial with creeping stems. Poison with sulphuric acid or spray with calcium chlorate, or grub out roots and rootstocks. Caution: Calcium chlorate applied as spray may destroy all other vegetation in the same area. However, the soil is not permanently poisoned and may be reseeded after several heavy rains. Fine spray applied to leaves only, or dust

applied to leaves only, may be used to kill plants without injury to neighboring vegetation, if used with care.

Lawn Pennyworth—If deep rooted, same treatment as for Yarrow. If shallow rooted, dust with fertilizer as for chickweed.

WHAT HAPPENS INSIDE A GRASS BLADE

By E. KLAUCKE

The main difference between the nutritional processes of plants and animals is that plants manufacture their own foods from raw materials, whereas animals cannot. All living cells, whether plant or animal, require starch and sugars (carbohydrates), proteins and fats.

It is in the grass blade that photosynthesis, the process of starch and sugar manufacture, takes place. This process consists essentially of the following: carbon dioxide and water are synthesized to sugar and starch under the influence of the green coloring matter of the leaf (chlorophyl) and light. Oxygen is given off as a waste product.

Although photosynthesis is the most important blade function, the synthesis of fats takes place largely in the leaves as does a considerable quantity of the proteins utilized by the plant cells.

Transpiration or the loss of water vapor from the plant through the numerous small "pores" of the leaf is another very important blade function. The amount of water vapor passing from the leaves by transpiration is extremely large.

All living cells respire or breathe all the time. Thus, respiration is another process going on in the grass blade. Oxygen is taken into the cells and carbon dioxide and water are given off as waste products — the very reverse, it will be noticed, from photosynthesis. Photosynthesis and respiration go on simultaneously during the daytime, but only respiration goes on at night.

Certain conclusions are to be drawn from the above:

Mowing, particularly the close clipping of putting green areas, tampers in no small degree with the natural processes of a grass plant.

Dust collecting on the surface of leaves clogs the "pores" on the leaf surface, thus reducing photosynthesis.

Because turf grass is kept under unnatural conditions, the turfman should supply raw materials in the form of fertilizers according to a definite program to fit the