

Healthy turf linked to iron supplements

■ Researchers have studied for years the link between iron and healthy turfgrass. Iron has been popular for several years with other members of the green industry, especially nursery growers. Only recently, however, has it become a valuable resource with golf course superintendents.

Current research—One study that links chelated micro-nutrients, and more specifically iron, to enhanced appearance and growth of healthy turfgrass was conducted last summer at Iowa State University by Dr. Michael Agnew, extension turf specialist.

Results indicate that areas treated with chelated micro-nutrients generally retain their dark-green color longer than non-treated areas (see Table 1). In some cases, as much as twice as long. Plus, treated turf maintains steady, but not excessive growth.

According to Agnew, an iron supplement is particularly important in areas where soil is both high in pH and calcium. The naturally occurring iron gets trapped in the soil's calcium and becomes unavailable for use by the plant. As a result, turf turns yellow and wilts.

Another factor that contributes to iron-deficient soil is frequent mowing at shorter heights. Mowing removes leaves, where

iron is stored. As superintendents try to keep up with demands for faster greens, they may keep greens at 1/8th inch or less, which means frequent mowing and potential iron deficiencies.

Supers in favor—Iron supplements increase root growth, which gives the plant a deeper water reserve. For superintendents, that means less watering. Greater root growth also means reduced wind and soil erosion. Plus, deeper roots enhance transpiration efficiency and "cooling" of plants.

Agnew's research also indicates that areas treated with chelated iron had green speeds equivalent to non-treated areas (Table 2), which is important to both supers and players.

Iron supplements also may reduce nitrogen requirements by as much as 30 percent. This is beneficial because, unlike iron, nitrogen actually decreases root growth and increases top growth. And increased top growth means more watering and more mowing.

"Using an iron supplement is essential to maintain top-quality turf," says Eric Lover, assistant superintendent at Dove Canyon Country Club in California. "My turf has better recuperative powers and

maintains its green color between fertilizer applications since we started using iron."

Where to apply—Iron is most helpful in alkaline and calcareous soils, which are prevalent in California. But the East Coast and Midwest also benefit from iron supplements in many of the same ways as California turf. In these areas, iron can even increase greenness in turf where there is no iron deficiency.

Steve Davis, turfgrass specialist for Target Specialty Products, distributes Ciba-Geigy's Sprint micro-nutrient in southern California. Since 1990, he says product sales have quadrupled in his area as superintendents begin to recognize the value of iron on golf course greens.

"Economically, the many benefits of iron supplements far outweigh the cost," says Davis.

For example, during the spring and fall, when days are warm and the nights are chilly, light frosts can destroy a turf plant's chlorophyll and slow photosynthesis. Iron negates that effect by triggering enzymes that keep grass green and prevent wilting.

Iron supplements, which are most commonly sprayed directly onto the leaves, may be applied year-round to the plant.

continued on page 42

Table 1

Influence of micronutrients and nitrogen fertilizer on the visual quality of bentgrass greens.

IRON SOURCE WITH NITROGEN	MAY		JUNE			AUGUST		SEPTEMBER		
	28	5	11	15	13	21	28	13	20	25
Agri-Plex For-X	8.0	8.3	8.0	8.0	8.3	8.7	8.7	8.7	8.3	8.0
Agri-Plex Fe 8%	8.0	8.3	8.0	8.3	8.3	8.3	8.3	8.3	8.3	3.7
Sprint 138 Fe	8.7	9.0	9.0	9.0	8.7	8.7	8.7	9.0	8.7	8.0
Sprint 330 Fe	9.0	9.0	9.0	8.7	9.0	8.7	8.7	8.7	8.7	8.3
FeSO	7.0	7.7	7.7	8.0	8.3	8.0	7.3	8.7	8.7	8.3
MnSO	7.0	7.7	7.3	8.3	8.0	8.0	7.7	8.7	8.7	7.7

Visual quality is based on a rating of 1 to 9; 9=dark green turf; 1=dead turf; 6.0=minimum acceptable quality.

Source: Dr. Michael Agnew, Iowa State Univ.

Table 2

**Influence of micronutrients and nitrogen fertilizer*
on creeping bentgrass cutting green stimpmeter ratings.**

IRON SOURCE	MAY		JUNE		AUGUST			SEPTEMBER		
	28	5	11	19	14	21	28	13	20	25
Agri-Plex For-X	70.2	71.0	75.7	80.7	74.9	84.5	81.1	69.3	78.2	70.8
Agri-Plex Fe 8%	69.0	67.1	74.4	79.4	69.3	79.5	77.2	61.5	72.5	66.3
Sprint 138 Fe	66.1	65.2	74.4	80.1	69.9	79.7	77.9	60.3	70.8	65.7
Sprint 330 Fe	64.9	67.1	70.8	76.5	66.5	76.5	75.4	59.9	71.9	64.3
FeSO	68.6	65.7	72.1	76.4	69.8	81.0	76.1	61.5	71.1	64.6
MnSO	69.5	69.5	76.2	81.1	72.5	84.3	80.1	65.7	76.6	68.9

The stimpmeter reading is the distance, in inches (vs. feet) a golf ball rolls on a green when using a USGA stimpmeter.

*There is no statistically significant difference among products.

Source: Dr. Michael Agnew, Iowa State Univ.

Iron from page 40

However, as a soil application, spring is the optimal time to apply iron supplements because spring rains will move the nutrient into the rootzone. In addition, spring applications ensure that iron will be available during the early flush of growth.

Why chelated iron?—Using a chelated iron supplement is particularly beneficial when applying iron into the soil. Experts describe chelated iron as similar to the protective shell of a nut.

As a chelate, iron is protected and stabilized, to make it available for use by the

turf for longer periods.

“Golf course superintendents, particularly those who have soil with high pH, should consider using a chelated iron source,” says Dr. Agnew.

“From the earliest stages of growth, the result is a healthier, hardier plant.”

Knowledge of lifecycle vital for control of white grubs

■ Skunks feasted on the grubs buried in the roots of the turfgrass surrounding the corporate office building in suburban Cleveland.

The damage, mostly in the low, moister areas of the property, reaffirmed the adage: to control a pest, first learn its lifecycle. This is particularly true of white grubs since they're below the soil surface. This also makes them harder to kill.

Typically, beetles that develop into white grubs—Japanese beetle, masked chafers, European chafer—lay their eggs in the soil in June or July. The eggs absorb moisture from the soil otherwise they won't grow and develop. The tiny first instar larvae needs sufficient moisture, too.

In fact, research into the lifecycles of white grubs in recent years stresses the importance of soil moisture. That's why poor control usually occurs when chemical controls are applied on drought-stressed turf in mid-summer. The white grubs have moved deeper into the soil, in effect, out of reach of the control.

Tasty summer meal—But by mid-summer 1991, the grubs at this showcase of a 10-acre corporate office site had grown large and juicy enough—and remained close enough to the soil surface—to attract skunks. The night-feeding skunks devastated about six patches of turfgrass, destroy-

ing a 10-by-30-yard oval patch of turfgrass in a depression adjoining a 3-acre marsh. This ribbon of turfgrass separates the natural, marshy area from a patio where company employees lunch if the weather is nice. Everyone in the building watched as the turfgrass damage, worsened by a mid-summer drought, grew.

The skunks also dug up turfgrass in a scattering of smaller areas, although they did no scavenging in the less intensively maintained, non-irrigated turfgrass fringing of the property.

The on-site turfgrass manager removed the dead grass and thatch, and treated the grub-infested areas of the property with diazinon. After the application, he watered the product into the soil. He said the treatment was successful. Skunk predation tapered off. He reseeded the devastated areas. After a mild winter and wet spring and early summer, the grounds are green and healthy.

They're back—However, he's pretty sure that white grubs began feeding on turfgrass roots earlier this spring than usual. Adequate rainfall in late spring and early summer is another reason why he began checking the roots of his turfgrass for evidence of white grubs earlier than he normally would.

He, like other turfgrass managers,

establishes a threshold to determine if he will apply an insecticide or not. Healthy turfgrass will sustain a certain population of white grubs before damage becomes visible.

However, if and when a manager determines that a control is needed, he or she must make a decision about control product, the method of application and the timing of application.

For typical weather (when is weather ever typical?), the best time to treat for white grubs is just after small larvae grubs emerge. This could be any time from mid-July through late summer. The tiny grubs are closest to the soil surface then. They're feeding.

As fall approaches the larvae molt. Falling soil temperatures cause the grubs to burrow deeper into the soil to spend the winter. When the temperature rises again in the spring, they work their way upward again and feed for several weeks, just a couple of inches below the soil surface.

In late spring or early summer, the grubs, in the pupal stage, quit feeding for several weeks. Then mid-June through July they change into adult beetles, emerge and burrow into the soil to lay eggs.

Check with your local extension agent for optimal grub control times.

—Ron Hall