

## Dealing with Ticks and Chiggers in the Turf Environment

Daniel A. Potter

Encounters with ticks and chiggers can be annoying, painful and, in the case of ticks, life-threatening. Knowledge of their habits can help you to safeguard employees, golfers, and other turf users.

### Chiggers

**The maddening itch that accompanies chigger bites must be experienced to be fully appreciated.** Adult chiggers are 8-legged mites, about 1/32 in. (1 mm) long, with a bright red, velvety appearance. Adults and nymphs live on or in the soil, where they prey upon small arthropods and their eggs. These older stages don't bite humans. Adults overwinter in the soil, becoming active and laying eggs in spring. **The eggs hatch into tiny, 6-legged larvae, the stage that bites humans. Larval chiggers are so small that they are barely visible to the unaided eye.**

**Larval chiggers crawl up grass blades, weeds, or other low vegetation and soon grab onto a passing victim.** They normally feed on rodents, ground-dwelling birds, or other wild hosts, but will also attack people. After feeding for a few days, the engorged chigger drops off and transforms into a free-living, soil-dwelling nymph, and later to an adult. The entire life cycle from egg to adult takes about 30 to 60 days, depending on temperature. Chiggers are most common in the southern half of the United States, where they may be active almost year-round, but they may be abundant in the summertime in northern states, too. There are 1 to 3 generations per year in temperate regions, and as many as six in the southern USA.

On humans, chiggers tend to crawl upward until they reach a place where clothing is pressed against the skin. **Bites are most common around the ankles, waistline, armpits, back of the knee, or groin area.** Chiggers do not burrow under the skin. They feed by sinking their mouthparts, often at the base of a hair, injecting saliva, which partially digests the subcutaneous tissues, and then sucking up the resulting soup. Most people react to chigger bites by developing dome-shaped, reddish welts within 24 hours. Reaction to the chigger's saliva causes intense local itching that lasts for a week or more. Scratching usually removes the chigger but can result in secondary infection, sometimes accompanied by fever. **Fortunately, the chigger species found in the USA do not transmit human diseases.**

People are most likely to encounter chiggers in vegetational transition zones such as high grass, weeds, or brushy areas bordering golf roughs or picnic areas, or around the edges of lawns. **Regular, close mowing makes such areas less suitable for chiggers and their wild hosts. Chiggers can be controlled by spraying infested areas with a pyrethroid insecticide (e.g., DeltaGard®, Talstar®, Tempo®, or Sevin®).** Thoroughly wet the ground and vegetation up to a height of 3 ft (1 m). High grass should be mowed before treatment to enhance penetration of the spray. **Tick repellents will help protect persons who must work in chigger-infested areas.** Products containing permethrin can be sprayed on clothing, but should not be applied directly to skin. Products containing diethyl toluamide (DEET) can be applied either to clothing or skin. Persons who suspect they may have been exposed to chiggers should take a hot, soapy bath as soon as possible, which will help remove any attached or unattached chiggers. Antiseptic, hydrocortizone, or anesthetic (benzocaine) ointments provide some relief from the itchy bites.

### Ticks

**Ticks, like chiggers, tend to be most abundant in tall grass, or weedy or brushy areas** where wild hosts such as rodents and rabbits occur. They can be very abundant in out-of-play areas of golf courses, or in overgrown vegetation bordering lawns, parks, or sports fields. **Besides creating anxiety and discomfort, tick bites can transmit several serious diseases, especially Lyme disease and Rocky Mountain spotted fever.** They are active from early spring through September in the temperate states, or longer in the south.

Adult ticks have eight legs and lack wings or antennae, making them closely related to mites and spiders. All life stages except for eggs are blood-feeding, and most species feed on three different hosts to complete their life cycle. Mating usually takes place on the body of a host. The female tick then drops to the ground to lay a mass of eggs, which hatch into tiny larvae, or "seed" ticks. The larvae attach to a small animal, feed, and then drop off and molt to eight-legged nymphs. These then seek another host, feed, and drop off to transform to adults, which require a third blood meal before they reproduce. When hungry, ticks crawl up low vegetation to await a passing host, detecting it by vibration, body warmth, and exhaled

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quality, and soil organic matter data were collected in 1998 and 1999, but soil microbial activity and leaf tissue N were monitored only in 1999. **There were few significant differences in dollar spot levels among most N-sources in either year.** In 1998 and 1999, Ringer Lawn Restore® delayed dollar spot to within an acceptable threshold from May to early June, when disease pressure was in the low to moderately severe range. **None of the organic N-sources or composts, however, reduced dollar spot when compared to the synthetic organic N-sources (i.e., urea and SCU) in either year.** The composted sewage sludge product, Com-Pro® (1998 and 1999) and Earthgro Dehydrated Manure® (1999), however, generally enhanced dollar spot, when compared to most other treatments. Data showed that **none of the N-sources had a significant impact on dollar spot after disease pressure had become severe.** Turfs receiving urea and SCU generally exhibited the highest turfgrass quality on most rating dates in both years. The turf quality of the urea and SCU-treated

bentgrass, however, did not generally vary significantly from plots treated with Milorganite, Ringer Lawn Restore, and Scott's All Natural Turf Builder. Lowest turf quality in both years was associated with plots treated with Earthgro Dehydrated Manure®, Com-Pro®, and non-fertilized turf.

**No N-source was consistently associated with higher levels of general microbial activity, when compared to the nonfertilized plots. General soil microbial activity data, which were collected in 1999 only, indicated that there was no correlation between soil microbial activity and dollar spot severity.** In May and June 1999, higher tissue N levels were observed in all fertilized turfs, when compared to Earthgro Dehydrated Manure® and the nonfertilized plots. When disease pressure was moderately severe (i.e., May and June), there was a strong negative correlation ( $P \leq 0.01$ ) between the amount of foliar N and dollar spot severity. That is, **there was less dollar spot**

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carbon dioxide. Initial contact with people is usually made on the foot, ankle, or lower leg. The tick then crawls upward until constricted by skin folds or clothing. Ticks often attach at the base of the scalp, at the waist or armpit, or behind the knee. After feeding, the blood-engorged tick drops off the host.

**Lyme disease is a potentially dangerous bacterial infection that is transmitted through the bite of a small tick call *Ixodes scapularis*.** Adults of this tick are about 1/8 in. (2 mm) long, less than half the size of adults of the common dog ticks. The nymphs are even smaller. But, larvae and nymphs of many common ticks are fairly small, so **it's wise to save the tick to take to a physician or extension specialist if one suspects that it may be the Lyme disease carrier.** Most reported cases have been in the Northeast, upper Midwest, and in California, but incidence of the disease is spreading. The disease is hard to diagnose because the early symptoms mimic the flu (fatigue, headache, fever, swollen glands, pain or stiffness in the neck, muscles, or joints). The most definitive early sign is gradually expanding circular or oval red rash at the site of the bite. However, this rash only develops in about two-thirds of infected persons, and it may be overlooked. **Persons experiencing any of the above symptoms after being bitten by a small tick should see a physician immediately.** In its early stages, Lyme disease can be successfully treated with antibiotics, but therapy becomes more difficult as the disease progresses. Left untreated, Lyme disease can result in chronic arthritis, heart disease, and neurological disorders. **A new, pre-**

**ventive vaccine is available for persons who live or work in high-risk areas.**

**Rocky Mountain spotted fever (RMSF) is a potentially fatal disease carried by common dog ticks and lone star ticks.** Symptoms begin 2 to 12 days after the bite and include headache, chills, muscle aches, and very high fever. The most characteristic symptom is a rash that appears on about the second to fifth day on wrists and ankles, later spreading to other body regions. RMSF can be successfully treated with antibiotics in its early stages, but can be life-threatening if left untreated. **For both Lyme disease and RMSF, the tick must remain attached for at least 12 to 24 hours for the pathogens to be transmitted. Thus, periodic body checks for ticks greatly reduce one's chances of being infected.**

**Management strategies for ticks are generally the same as described for chiggers. To remove an attached tick, grasp its head with tweezers, close to the skin, and pull slowly and steadily until the tick is dislodged.** If tweezers aren't available, grasp the tick with a piece of tissue, placing fingernails on or just behind the mouthparts. Try not to squeeze or crush the tick. Folk remedies such as coating the tick with nail polish or vaseline don't work. Squeezing the tick, or touching it with a hot match, may cause it to regurgitate infected fluids into the wound. After removing the tick, wash the bite site and your hands, apply antiseptic, and cover with a bandage strip. Place the tick in a bottle, preferably with alcohol, and save it for at least 3 weeks. Should disease-related symptoms appear, having the tick may help the doctor with diagnosis. 