

Magic from the Manual: Occupational Health and Safety

By Bert Swanson, Swanson Nursery Consulting

The beginning of the busy work season and the on set of warm weather should be tempered with emphasis on safety. General safety is always paramount, but there are specific human diseases that can raise their ugly heads against everyone in the Green Industry as we charge into the exciting Spring work. Some of the foes that could be on attack are discussed below.

Sporotrichosis – Sporotrichosis is a lymphatic disease of concern to nursery personnel, farmers, gardeners, foresters, and anyone handling infested material. It is caused by a fungus, Sporotrichum schenckii (also Sporothrix schenckii var. Ajello & Kaplan). The natural habitat of the fungus is soil, sphagnum moss, and some plant material, but it has also been found in commercial potting soil, flowers, shrubs, and even wooden mine support beams. Under some environmental conditions, with moisture, light, and temperature favorable to the fungus, sphagnum **moss** can become grossly infested and may remain infested for over a year. There is no evidence that the fungus is a plant pathogen, although it has been found associated with a variety of trees, grasses, flowers, and hay.

Sporotrichosis occurs worldwide in both temperate and tropical zones, but it appears to be most common in the Midwest. It often appears as a skin disease affecting the exposed parts of the body such as arms, legs and hands. Cutaneous and subcutaneous forms of the disease are usually associated with an injury to the skin such as an abrasion, or a prick by a thorn or splinter. A lesion, blister or papule will develop in one to four weeks at the site where spores were introduced into the skin. The lesion may remain localized, or secondary lesions may appear as the fungus spreads along lymphatic channels. The lymph glands in the armpits or elbows may become enlarged and sore. In some cases, bone joint and abdominal pains may become involved. The lungs can also become infested. If diagnosed early, the disease can be adequately treated and is rarely fatal.

If it is suspected that someone has contracted Sporotrichosis, a doctor should be seen immediately. For a positive diagnosis, the fungus must be cultured on Sabouraud's agar from specimens properly obtained from the patient. Anyone working under the conditions described above, and particularly with sphagnum **moss**, should take precautions described below. Sphagnum moss is more likely a host than sphagnum peat.

1. When working with sphagnum moss and with material containing sharp objects such as thorns, splinters, or sticks, wear heavy gloves, long sleeves, thick-soled shoes, and heavy clothing.
2. Hands and arms should be washed thoroughly with soap and water after exposure to sphagnum moss or nursery soil. Disinfect any wounds received while working with material that may be infested.
3. Store sphagnum moss indoors under dry conditions.
4. In areas where dust from sphagnum moss may be present, wear a mask.
5. Report any suspicious skin infections as soon as detected.

Even though Sporotrichosis is not a serious disease if promptly diagnosed and treated, many physicians are unfamiliar with the disease and often misdiagnose it. This prolongs the time before proper treatment, thereby prolonging and complicating treatment. The treatment for Sporotrichosis is oral doses of potassium iodide solution. The treatment is effective, but, they may need to be continued for several months until all symptoms have disappeared. A possible side effect of treatment includes a perpetual upset stomach even after treatments have been discontinued.

Darrell D. Shilling, Principal Plant Pathologist, USDA Forest Service, North Central Forest Experiment Station in St. Paul, MN, who contracted this disease from planting seedlings packed in sphagnum moss, states: **“Nursery workers and tree planters who develop sores that do not heal properly should promptly seek medical attention and tell their doctors about the possibility of Sporotrichosis.”**

Blastomycosis – is a rare fungal infection found in dogs, people and occasionally in cats. It is caused by a single fungal species, Blastomycosis dermatitidis, which is found as a mold primarily in sandy, acidic soils near river valleys or other waterways. It is endemic in the Ohio, Mississippi, and St. Lawrence River valleys, the Great Lakes region, and along the eastern seaboard.

In 2001, there were two deaths in Minnesota thought to be caused by Blastomycosis. Green Industry personnel working outside in wet soil conditions and experiencing flu-like symptoms or a recurring cough, which a doctor is unable to treat successfully, should inform the doctor of this work environment and suggest a biopsy for Blastomycosis. Blastomycosis is often difficult to diagnose because of its wide spectrum of manifestations, varying severity, and unusual occurrence in most geographic areas.

In humans, Blastomycosis occurs six times more frequently in males than in females, and typically affects middle-aged patients. The infection is initiated by inhalation of the dimorphic fungus after disturbance of contaminated soils. Nearly all cases originate in the lungs although dissemination may occur to any organ from the lungs with preference to the skin and bones. The incidence rate is one to two out of every 100,000 population in the areas where the disease is endemic. The incidence rate is far less outside these areas.

Two basic forms of Blastomycosis have been recognized: Pulmonary Blastomycosis and Chronic Cutaneous Blastomycosis. The symptoms generally include cough, shortness of breath, sweating, fever, joint stiffness, weight loss, chest pain, skin lesions, hemoptysis or spitting up blood, and localized swelling. In some patients, the initial pulmonary infection presents symptoms of mild respiratory infection. In other patients, the pulmonary focus becomes more severe and is accompanied by pleuritis or inflammation of the membranes that line the lung cavities.

The most common feature of Blastomycosis is a pulmonary, mass-like, infiltrate which fills the air pockets in the lungs. The upper lobes of the lungs are the predominant sites for these infiltrates which are characteristic of Chronic Blastomycosis which may result in permanent lung damage. Because of the tremendous variety of symptoms, Blastomycosis is often mis-diagnosed as some other infection. Dissemination occurs to the genitourinary tract, skin, liver spleen, bone, lymph nodes, heart, adrenals, GI tract and pancreas. In Chronic Cutaneous Blastomycosis the initial skin lesion is seen as one or more subcutaneous nodules that eventually ulcerate. They are most commonly found on exposed skin such as face, hands, wrists and lower leg. Response to treatment tends to be good.

Tetanus – The bacteria, Clostridium tetani, is present almost everywhere, but especially in soil, manure and dust. This bacterium enters through breaks in the skin, including burns and puncture wounds. Toxins produced by the bacteria invade nerves that control muscle contractions, resulting in muscle spasms and seizures. Tetanus is commonly called ‘lockjaw’ and results in an excruciatingly painful death in about 50% of the cases. Prevention is accomplished through immunizations during childhood, but a booster shot is required every ten years to maintain protection.

Lyme Disease – Lyme disease is a disease transmitted by deer ticks and western black-legged ticks that have been infected with Lyme disease bacteria by feeding on rodents and other animals that are infected. May through August are the most popular months for Lyme disease, according to the Centers for Disease Control (CDC), because young, growing ticks are most active, and people are frequently outdoors and have more skin exposed during this time period.

These ticks are most often found in the grassy and wooded areas of the Northeastern and upper Midwestern states. The ticks are easily transferred to people or animals that brush against the vegetation. Ticks can attach anywhere to the body, but are usually found embedded in the hidden and hairy areas such as the groin, armpits and scalp. They are extremely small, actually smaller than a pinhead, in their young nymph stage. A hand lens may be necessary to see that they are a tick. They feed on a person’s blood for days without being noticed. Usually Lyme disease is transmitted to the host after two or more days of feeding by an infected tick.

If untreated, Lyme disease can be severe and can lead to arthritis, neurological problems such as facial paralysis, motor and sensory nerve inflammation, or brain inflammation. It also infrequently causes cardiac problems. The short term symptoms are usually flu-like. Sometimes the person will also get a rash in the shape of a

“bull’s-eye.” The most common flu-like symptoms are fever, headache, muscle aches and joint pain, which typically occur at least seven to 14 days after exposure. People exposed to Lyme disease can be treated with antibiotics if the disease is discovered early.

Two additional diseases transmitted by the deer tick include Babesiosis and Anaplasmosis which is also known as Ehrlichiosis. These diseases occur less frequently than Lyme disease, but they can be as severe or more severe than Lyme disease. They have occurred in Minnesota.

Employers should train employees on proper prevention techniques and on what to do if a tick is found. When in wooded areas, walk around overgrown areas of brush or very wooded areas, and use the centers of trails away from overhanging brush. Employees should be instructed to wear light-colored clothing so the dark-colored ticks may be more easily spotted. Covering all skin with long pants and a long-sleeved shirt and covering the head with a hat is a good defense. Employees should tuck their shirt into their pants and their pants into their socks when possible so ticks cannot reach their skin. Proper footwear, such as boots or closed-toed shoes, is best. Insect repellents with DEET also help to keep ticks from attaching themselves. Employees should check themselves for ticks once out of the wooded or brushy areas. At the employee’s discretion, a coworker may help check the scalp since that area is hard to inspect. If the employee finds an embedded tick, it should be removed with a tweezers. The CDC recommends grasping the tick firmly and as close to the skin as possible. Pull the body with a gentle, yet firm, steady motion. Try to remove the tick and its mouthparts. The mouthparts may not be successfully removed, but according to the CDC, the bacteria that cause Lyme disease are stored in the tick’s glands in its midsection rather than the mouthparts. Cleanse the area thoroughly with an antiseptic. If a tick is found and successfully extracted, place it in a moist piece of tissue paper inside a closed jar. Label the jar with the date, the location where the tick was found, and where on the body it was found. The employee should then seek medical attention and show the tick to the medical personnel. If an employee never finds a tick, yet has symptoms, medical attention should also be obtained. Also, if an employee has the flu-like symptoms, but never notices a rash, medical attention should also be obtained.

With an early discovery and the appropriate use of antibiotics, Lyme disease and associated diseases are often curable. The best defense is proper dress, inspection and medical attention if symptoms or an incident occur.

Sample Questions

1. T F Sporotrichosis is a disease that is transferred from woody plants to Humans.
2. T F Flu-like symptoms or a recurring cough could be due to an infection of Blastomycosis.
3. The causal agent of Lyme Disease is:
 - A. Mosquito
 - B. Bacteria
 - C. Fungus
 - D. Wood Tick
 - E. Virus
4. T F Two types of Lyme Disease are: Pulmonary Blastomycosis and Chronic Cutaneous Blastomycosis.
5. Tetanus is prevented by immunization during childhood with a booster shot every _____ years.
 - A. 6
 - B. 12
 - C. 3
 - D. 10
 - E. 5

Answers: 1. False; 2. True, 3. B.=Bacteria; 4. False; 5. D. 10.