Tomato Crop

Pests & Diseases

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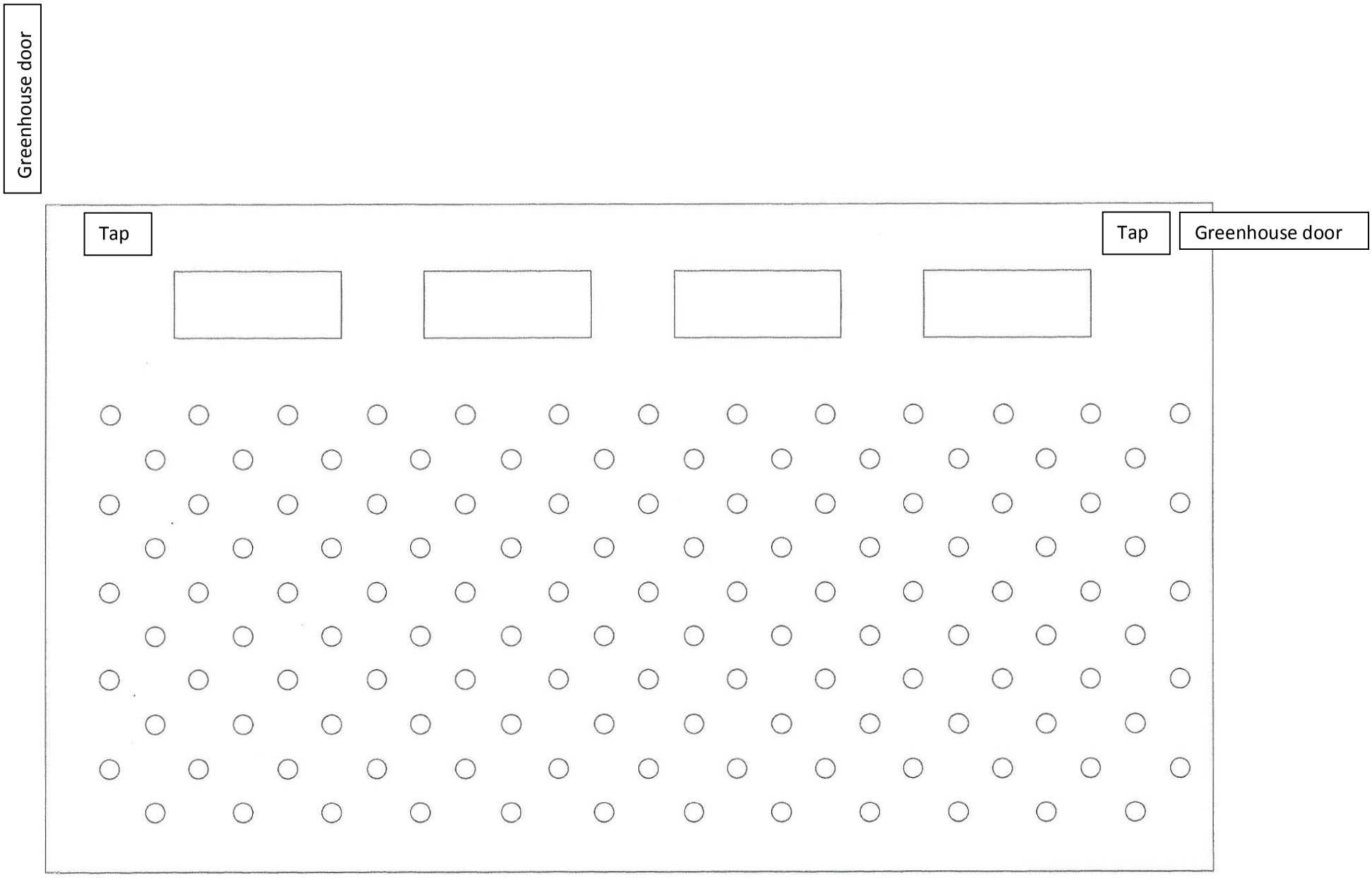
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Tomato Crop: Pests & Diseases

Pictured on the previous page is a diagram of a small tomato patch, slightly resembling the nursery area outside the Durham College greenhouse. Each circle on the map represents a tomato plant, metal t-bars used as supports for the tall plants. There are two taps nearby for irrigation, and the entire patch is surrounded by driveway, so the potential for air pollution and salt damage to the soil is high. Because of the likely salt damage, all tomato plants have been installed into buckets instead of in-ground. This crop is likely to be affected by multiple known pests in the area, a few of which are to follow.

Tomato Hornworm

Manduca quinquemaculata, also known as tomato hornworm, can be found throughout North America. This large green caterpillar can measure up to a whopping 3.5 inches in length, and approximately 1/3 inch in width. They have a distinct black horn on their rear end, and multiple distinct white v-shaped marking along their sides. The tomato hornworm caterpillar is the larval stage of the sphinx or hummingbird moth. The moths remain in the soil as dark brown pupa over the winter, emerging in spring to mate and then lay eggs. Eggs are laid on the underside of leaves, hatching shortly afterward as a smaller version of the hornworm caterpillar we know as a pest. It will take about four weeks to grow to full size, eating its way through tomato plants until it completes the cycle and returns again to the soil to pupate.

Tomato hornworms feed on all above-ground parts of tomato plants, and are found mid-to-late summer in peak tomato harvest season. To scout for these pests, tomato plants should be checked for feeding damage, such as the consumption of entire leaves or fruit. The damage can usually be seen before the caterpillars, as their colour helps them blend in with the plant foliage.

Natural Enemies of Tomato Hornworms

Wasps such as yellow jackets are a natural enemy of the tomato hornworm, as are green lacewings and ladybugs. Small braconid wasps lay their eggs inside tomato hornworms, where their larva eat their way out and then cocoon themselves on the outside of the hornworm body. If a hornworm caterpillar is found with these cocoons on their body, the hornworm should be left alone so that the braconid wasp life cycle can continue to parasitize another generation of tomato hornworms.

How to Fight Tomato Hornworms? Threshold for Tomato Hornworm

These creatures are large enough that they can be picked off plants by hand, then either crushed or left in a bucket of water to die. Plants should be scouted from late spring throughout the summer in order to capture as many as possible. The threshold for tomato hornworm is equal to one larva present per thirty plants; remove them as noted. (Tomato or Tobacco Hornworm, 2019)

Tarnished Plant Bug

Lygus lineolaris is also found throughout North America and is known to attack a wide variety of fruit & vegetable plants. Adults lay eggs inside plant tissues or leaf veins, and eggs will hatch within a week. Temperature plays a vital role in how quickly nymphs go through all five of their instars; high temperatures will see a complete cycle in as little as 12.5 days, while cooler temperatures can result in a 40 day cycle. New adults will lay their eggs in a week, and can lay from 1-3 eggs each day of adulthood, lasting a month. Adults overwinter in weedy areas, and will emerge in early May to begin laying eggs. There can be two or three generations of tarnished plant bug each summer, so scouting for these bugs must take place all season. With tomato plants in particular, tarnished plant bugs become active eaters from early July until late August.

Tarnished plant bugs have piercing sucking mouth parts, and consume the juices from leaves, fruits, flower buds and new shoots. This leaves scabby or deformed fruit, dead buds and damaged cells. “The only key symptoms of tarnished plant bug infestation are damaged fruit.” (Tarnished Plant Bug, 2019) Unripe fruit will become dimpled and misshapen, ripe fruit will develop white circular spots, making it unattractive to consumers.

Natural Enemies of Tarnished Plant Bug

Natural predators of the tarnished plant bug include damsel bugs and pirate bugs, who feed on the nymph stage of the pest.

How to Fight Tarnished Plant Bug? Threshold for Tarnished Plant Bug

Keeping nearby areas clear of weeds will lessen the habitat for overwintering tarnished plant bugs. Keep areas weed-free for the entire growing season. Physically blocking tarnished plant bugs from accessing your crops will help keep them at bay, such as with floating row covers. Placing white sticky traps around plants will attract and trap tarnished plant bug. Seriously infested areas can be sprayed with pyrethrin, but only as a final option. (Lygus Bugs (Western Tarnished Plant Bug), 2019) There are no established thresholds for tarnished plant bug, keep preventative measures in place to avoid any threat. (Tarnished Plant Bug, 2019)

Anthracnose

Colletotrichum spp. Anthracnose is caused by a group of fungi responsible for many diseases in a variety of crop species, *Colletotrichum*. This fungus is most often found along the Eastern Seaboard, and causes lesions on the stems, leaves and fruit of infected plants. Anthracnose can be identified by the pink jelly-like centres of lesions, in humid, warm weather. Infection spreads quickly, and full crops can be reduced to waste in a matter of days.

Infection can occur from 10°C - 30°C, and will progress more quickly when there are extended leaf wetness periods. Symptoms will only appear on ripened fruit, but the infection can begin on unripened green fruit.

How to Fight Anthracnose? Anthracnose Threshold

A pre-emptive fungicide program is the only way to fight anthracnose. Once the fruit of a plant has been infected, it is too late to apply fungicide and expect any results. These sprays should commence once first fruits appear and are approximately walnut-sized. Sprays must be repeated throughout the season, as needs warrant.

To avoid anthracnose from getting to the potted tomatoes in this nursery, all tools must be cleaned and sanitized after use in the field, in order to prevent the spread of any fungi from the field soil to the tomatoes. Hands must also be cleaned, and gloves changed if they have been in contact with any potentially infected soil. To avoid any spread of infection, composted materials from field crops will not be used to either pot up or amend the soil of these tomato plants. (Anthracnose, 2019)

Late Blight

Late blight is caused by a fungus, *Phytophthora infestans*, and is a disease that occurs late in the season and may not show symptoms until after blossom. It will appear first on older leaves, and takes the shape of water soaked grey spots. These spots darken as the disease ages, and white fungal growths will appear on the underside of the leaves in the same location as the spots. Late blight spreads quickly, and the entire crop can be severely damaged in a very short time. Fruit lesions can appear rough and greasy looking.

Late blight doesn't come from infected soil like most fungal diseases; infecting spores enter a field from infected seeds, transplants or tubers. Wind is also a carrier for late blight, and proximity to an infected field increases the chances for outbreak. Wet humid weather, combined with temperatures 20°C and up will add to the risk and hasten the spread.

Scouting for late blight infected plants should monitor lesions that don't stop at leaf veins. Carefully remove any potentially infected leaf (gloves on), place in a plastic bag with a piece of damp paper towel and leave overnight. Check the next day for the signature white moldy growth on the underside of the lesion

How to Fight Late Blight? Late Blight Threshold

Ensure that plants are spaced to allow for excellent air circulation. Avoid overhead irrigation, and remember to water in the early morning so that plants have a chance to dry out during the day. Don't compost tomato plant waste. Application of a copper based fungicide each week, following heavy rainfall periods or when late blight is spotted. Apply fungicide after watering and when there is no rain in the forecast, so that there is a period of at least 12 hours of dry weather afterwards. There is no threshold for late blight. Any and all infected plants should be treated; if they are beyond the point of treatment then they should be disposed of immediately (not composted). (Late Blight, 2019)

Fun fact: Late Blight was the cause of the Irish Potato Famine. (Late Blight, 2019)

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