2021 On-Farm New Engla P2y1

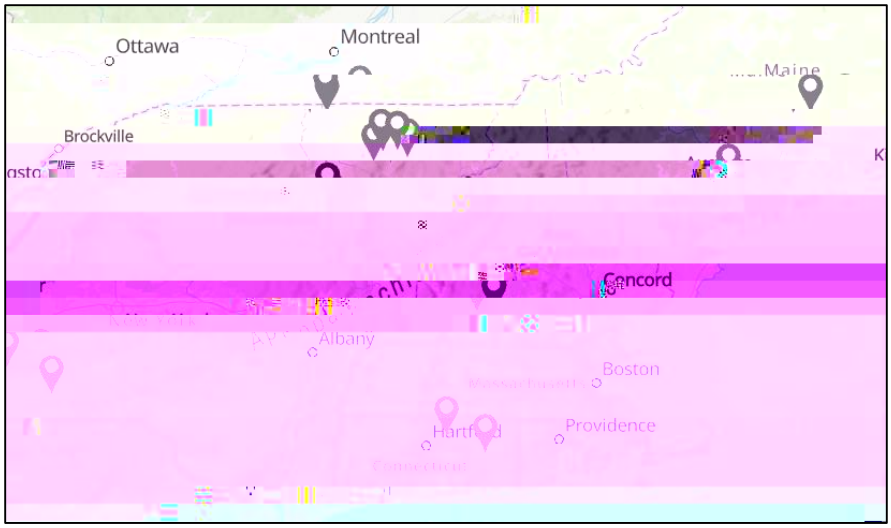


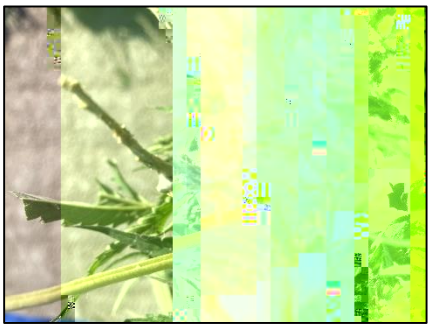
Figure 1. Locations of farm scouting sites, 2021. (Esri, WGS 84 Basemap).

Since the type of diseases and pests change over the course of the season, farms were scouted at two critical periods during the growing season; at flower development stage (mid-August) and just before harvest (mid-September). Three adjacent plants were scouted at five locations within each field in a W-shaped pattern to ensure all quadrants of the field were assessed. Five leaves were randomly selected including top, mid and lower sections of the plants, as well as the terminal and 4 axillary cola buds (pre-harvest), and evaluated for incidence (number of leaves affected) and severity (% total leaf damage; see Figure 2) for each of the diseases and insect pests listed in the scouting form. Incidence results refer to the leaves scouted, except for botrytis, which includes the cola buds. Stems, crown, and root issues were also noted if present, and the presence of other diseases, pests, or disorders were noted.

Figure 2. Leaf assessment scale from Hemp Diseases and Pests, McPartland, 2000.

Common Diseases in Industrial Hemp

Sclerotinia sclerotiorum, or white mold, spreads by spores that are carried by wind and insects (Figure 3). Spores infect the stem and flower in hemp. The resting bodies of the fungus, sclerotia, can overwinter in the soil and remain viable for over 5 years. Moist conditions, high humidity, and warm temperatures encourage spore survival and growth. Seedlings may rot or become stunted, leading to poor establishment and lower yields. Alternative hosts include many broadleaf crops and weeds, so good weed control and proper rotations are key to its management.



Botrytis cinerea, or grey mold, is a necrotrophic fungus that can cause brown, damp lesions on the plant. Infected leaves and flowers become necrotic and produce grey spores, and stalks may break (Figure 4). When

European cornborer do not prefer hemp, but if a preferred host is not available during one of the two flights, the adult moths will lay eggs on hemp (Figure 8). The peak 1st flight late June to early July in VT will result in damage to stalks and stems causing them to break. In most of our region, enough degree-day accumulation occurs for a 2nd flight in August that can lead to damaged buds.

Flea beetles

Figure 10. Leaf spot severity, 2021. Average leaf spot severity is represented by the size of the dot, which marks the farm location. The average severity of all disease scouted is represented by the color of the marker. *(Legend below Figure 11).*

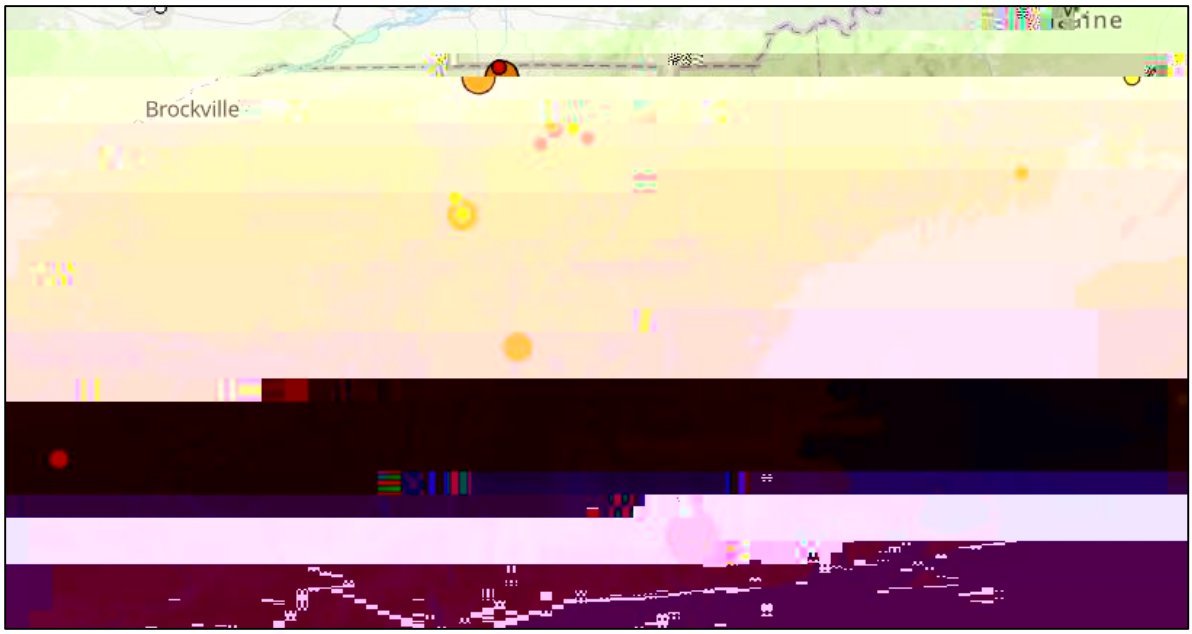


Figure 11. Botrytis severity, 2021. Average botrytis severity is represented by the size of the dot, which marks the farm location. The average severity of all disease scouted is represented by the color of the marker.

Low average (all disease) severity — High average (all disease) severity

Table 2. The average severity of diseases on hemp at flowering and pre-harvest in Connecticut, Maine, and New York, 2021. S

There are several cultural practices that can help to manage diseases including growing varieties with known tolerance or resistance to disease, proper crop rotation, adequate crop spacing to maximize airflow, and proper nutrient management. We also highly recommend buying "certified" seed when possible. Certified seed guarantees that the seed meets or exceeds a strict set of quality control standards. Weed management is especially important to improve airflow and assist with keeping the canopy as dry as possible. Weeds can also harbor diseases that may also impact the hemp crop. Trimming the lower branches of large hemp plants can also help with airflow and slow the spread of disease. Spores from many of the fungal diseases can survive in the soil for 3 to 5 years waiting for their host plant and/or ideal conditions. Crop rotation away from host crops and healthy soil are critical to minimizing diseases.

If you determine that a chemical control is necessary, currently there are few EPA-registered pesticide products labeled for use on hemp. Read and follow pesticide labels carefully. Be very aware that broad-spectrum insecticides kill natural predators and often lead to secondary outbreaks of other pests.

The most recent information about EPA approved pesticides for hemp can be found at: https://www.epa.gov/pesticide-registration/pesticide-products-registered-use-hemp

Policies from the Vermont Hemp Rules, including pesticide polices for the state, can be found at: https://agriculture.vermont.gov/public-health-agricultural-resource-management-division/hemp-program/hemp-resources-and-guidance

References

McPartland, J. M., Clarke, R. C., & Watson, D. P. (2000). *Hemp diseases and pests: management and biological control: an advanced treatise*. CABI.

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