The Role of Weather in Disease Progression

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Take home message:
Understanding and adapting to the influence of weather on disease progression is the key to safeguarding your hemp crop. Reducing leaf wetness is vital to prevent disease progression and optimize hemp yields.

Figure 1. Wind and water damage are aggregated in the field. Because this field is located on a slight incline, there is variation in the areas most heavily impacted by wind and water.

Regular weather monitoring

• Regularly monitor weather conditions, especially temperature, humidity, and rainfall, as these factors significantly influence disease progression.
• Use local weather data and forecasts to anticipate disease risk and take preventive measures.

Implement preventative measures

• Adjust planting and spacing to promote air circulation and reduce humidity, particularly in regions with high humidity and frequent rainfall.

Integrated disease management

• Adopt integrated disease management strategies that incorporate cultural practices, resistant cultivars and, when necessary, disease control products.
• Be prepared to adjust disease management practices based on weather conditions to prevent and mitigate outbreaks effectively.

For up-to-date IPM forecasts and weather data: https://newa.cornell.edu/
**Figure 2:** Disease tends to have an aggregated or patchy distribution in the field. The plant in the front appears to be unhealthy while the plants surrounding it appear healthy.

**Figure 3:** Standing water in a hemp field can create a conducive environment for disease development. Prolonged waterlogging can suffocate plant roots, weaken hemp plants, and increase humidity levels, all of which can promote disease development.

**Wind:** Can help reduce humidity around plants by promoting air circulation, which is beneficial for many diseases, but strong winds can physically damage plants and may aid in the spread of pathogens.
- **Management:** Utilize plant and row spacing that encourage air movement. Schedule sprays during calm, windless periods to ensure better coverage and efficacy.

**Humidity:** Encourages spore production, germination, and disease spread.
- **Management:** Schedule preventive sprays during periods of high humidity to inhibit disease development. Manage canopy density and plant spacing to reduce humidity levels.

**Rainfall:** Helps spread pathogens and promotes foliar diseases when leaves remain wet for extended periods.
- **Management:** Apply protective treatments before anticipated rain events. Focus on drainage and proper soil preparation to reduce waterlogging risks.

**Temperature:** Different diseases have specific temperature thresholds for development.
- **Management:** Use disease models and local weather forecasts to predict temperature fluctuations and plan treatment accordingly. Adjust planting times to avoid peak periods of temperature-related disease development.

**Disease-specific considerations**
- Powdery mildew: low light, moderate temperatures, high humidity
- Downy mildew: cool temperatures, high humidity
- Septoria leaf spot: warm temperatures, excessive rain, high humidity
- Pythium and fusarium wilt: broad temperature ranges, standing water
- Botrytis gray mold: high humidity and poor airflow

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