

PROGNOSIS OF DOWNY MILDEW (*Pseudoperonospora humuli* Miy et Tak.) WITHIN HOP PROTECTION MANAGEMENT IN CZECH REPUBLIC

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A method of short-time prognosis has been developed for **hop downy mildew (*Pseudoperonospora humuli* Miy et Tak)**. It is based on daily meteorological records of temperature, relative humidity and total rainfall. The downy mildew index (i) is calculated from these data using alternative equations. The scheme for **Saaz aroma hops** has been in use since the eighties (**Petrlik & Stys, 1988**).

$$A/ \text{ for days with rain: } i = 100 + 10 (t - 15) + 2 (R - 60) + r$$

$$B/ \text{ for days without rain: } i = \frac{100 + 10 (t - 15) + 2 (R - 60) + r}{S}$$

t = daily average temperature in °C, **R** = average relative air-humidity in %, **r** = total daily precipitations in mm, **S** = number of days without rain

Information additional to the prognosis is provided by the evaluation of the incidence of the disease on leaves, flowers and in cones at fifteen days intervals from the beginning of June until the period before harvest. A danger of mildew occurs, either if the downy mildew index reaches the value higher than 500 or at the incidence of 100 blotches per 100 leaves or later whenever downy mildew infection is found in inflorescence or cones. During the period of vegetative growth, six separate sprays are scheduled between June 06 and August 25 for Saaz and Ustek Bohemian hop regions and seven sprays between June 01 and August 25 for Trsice Moravian hop growing region.

Methodology of the protection within **hybrid hop varieties** against downy mildew has been developed recently. The main objective of the methodology consists in short-time prognosis of downy mildew for these varieties. As they are generally more susceptible to infection caused by downy mildew, it is impossible to use the traditional method recommended for aroma hops. Therefore, it was necessary to create a new strategy, which would be suitable also for the hybrid varieties; whose percentage has still had the progressive trend within Czech variety structure. It consists in the determination of different downy mildew indexes (i).

Thanks to this method it is possible not to carry out all the treatments if there is no or only low infection. In this way we not only save money to hop growers but we help to decrease the pollution of the environment in hop growing areas as well (**Vostrel et al., 2008**).

Up-to-date information on the occurrence of downy mildew and methodical recommendations on treatments against this disease are available on the following address: www.chizatec.cz. Czech Hop Grower's Association also sends them via e-mail.

REFERENCES

- **Petrlik, Z.; Stys, Z., 1988:** Prognosis of diseases and pests in integrated control on hops in Czechoslovakia In IOBC WPRS Bull., XI/5, East-Malling, England: 49-55.
- **Vostrel, J.; Klopal, I.; Kudrna T., 2008:** Methodology of protection in hybrid hop varieties against downy mildew (in Czech). Hop Research Institute, Zatec, Czech Republic: 23 pp.

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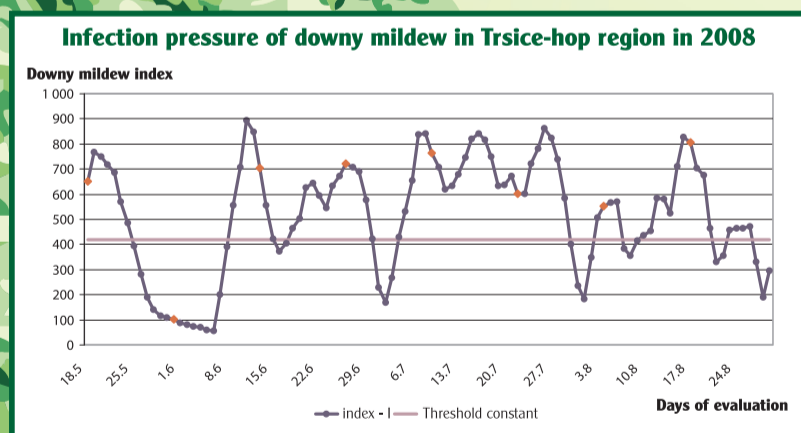


Figure 1:
Hop cones damaged by downy mildew



Figure 2:
Hop cones free from downy mildew symptoms



Figure 3:
Typical "spike" caused by heavy infection of downy mildew during spring time



Figure 4:
Damage caused by downy mildew on leaves – typical brown blotches



Figure 5:
Damage caused by downy mildew on cones in a hop-garden

