

212 - New findings on the development of insensitive isolates of *Pyrenophora teres* towards SDHI fungicides

Neue Erkenntnisse zur Sensitivitätsentwicklung bei Pyrenophora teres gegenüber SDHI Fungiziden

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Net blotch caused by *P. teres* is an important disease of barley. Succinate-dehydrogenase-inhibitors (SDHIs) are very effective fungicides for net blotch control. Sensitivity of *P. teres* to SDHIs was monitored before and after market introduction. The first SDHI fungicide introduced for net blotch control in Europe was boscalid, followed by others such as fluxapyroxad, bixafen, isopyrazam and penthiopyrad. First isolates with a lower sensitivity to all SDHIs registered in barley were identified in 2012 carrying the B-H277Y mutation. In 2013 a significant increase of isolates with lower SDHI sensitivity was identified. This trend continued in 2014.

Most of the adapted isolates carry the C-G79R mutation with a stronger impact on SDHI sensitivity than the B-H277Y in microtiter tests. Other mutations are currently of less importance, since they are less frequent. Most mutations have similar effects to all SDHIs, but in some cases responses are different, eg. mutation C-N75S has nearly no impact on boscalid but reduces sensitivity to isopyrazam in microtiter tests. Glasshouse tests showed that mutated isolates were well controlled by most SDHIs, especially by the SDHI fluxapyroxad, but efficacy was reduced when SDHIs were challenged with curative applications in the greenhouse.

Most isolates from 2013 carrying the C-G79R mutation did not carry the F129L mutation in the cytochrome *b* (*cyt b*) in addition, which is correlated with sensitivity to QoI fungicides, a further important fungicide class for net blotch control (Table 1). Nevertheless, some double mutants do exist not only for C-G79R but also for other SDHI mutations. This led to the concern that such isolates would be more difficult to control. However, previous studies with the QoI strobilurin fungicide pyraclostrobin showed no or low impact of the F129L mutation in *cyt b* on field efficacy of pyraclostrobin (Semar et al. 2007).

The remaining activity of fluxapyroxad on SDH mutants and the good efficacy of pyraclostrobin on F129L mutants make the combination of Adexar® plus Diamant® an effective tool for control not only net blotch (even for populations with the above mentioned G79R + F129L mutations) but also of other barley diseases.

Tab. 1 Number (Percentage) of isolates from 2013 with SDH mutations causing lower SDHI sensitivity, absolute and in combination with F129L in cytochrome *b* (n=279).

Subunit-Mutation	C-G79R	B-H277Y	C-N75S	C-H134R	C-S135R	D-D124N/E	D-H134R	D-D145G
All	202 (72%)	32 (11%)	7 (3%)	14 (5%)	18 (6%)	2 (1%)	2 (1%)	2 (1%)
F129L -	195	6	6	13	13	0	2	2
F129L +	7	26	1	1	5	2	0	0

References

SEMAR, M., STROBEL, D., KOCH, A., KLAPPACH, K. AND STAMMLER, G., 2007: Field efficacy of pyraclostrobin against populations of *Pyrenophora teres* containing the F129L mutation in the cytochrome *b* gene. *J. Plant Dis. Prot.* **114**, 117-119.