Genetic pest resistance in wheat ~ is it possible?

Tracy Creasy, Conventional Cereal Asset Manager, Europe North
OWBM – a success story

- Resistant varieties in all quality groups
- All varieties have same resistance gene
- Risk if pest overcomes resistance
- Integrated control required for susceptible varieties

### YIELD, AGRONOMY AND DISEASE RESISTANCE

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<tr>
<th>End-use group</th>
<th>UK</th>
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<td>Scope of recommendation</td>
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<td>East region (10.7 t/ha)</td>
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<th>Resistant varieties</th>
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<td>- Wound plugs in developing grain of resistant variety</td>
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Other genetic resistances present in modern wheat

- Genetic resistance does exist for some other insect pests
  - Russian Wheat Aphid
  - Hessian Fly
  - Saw Fly

- There is no genetic resistance in modern wheat for two of the UKs most important pests
Aphid resistance – the challenge

The Target Pests

Rhopalosiphum padi
Siptobion avenae

Rhopalosiphum padi mean nymph weight (mg) after 6 days on T. monococcum parental lines and F1 crosses

Sitobion avenae mean nymph weight (mg) after 7 days on T. monococcum parental lines and F1 crosses

Nymphs produced on MDR045 and MDR657 – plants older?
Lower feeding and nymph production

Reduced feeding by *R. padi* in EPG bioassays in WISP

Behaviours: np: not probing, C: pathway phase, E1: salivation, E2: phloem ingestion (feeding), F: derailed stylet mechanics, G: xylem ingestion (drinking)

Reduced fecundity of *R. padi*

no nymphs produced on MDR045
Summary

● Genetic resistance does exist in modern UK wheat to some insect pests
● Insect resistance is not currently perceived to be a priority when choosing which variety to drill
● Some element of aphid resistance is possible but not in the immediate future
● Possible resistances identified so far lead to reduced feeding and reduced nymph production – but does not stop feeding entirely
● Virus transmission will still be a key problem
● There is no ‘quick fix’ from conventional wheat breeding
● UK wheat growers will continue to require chemistry to ensure adequate wheat supply