

Improving Aphid & BYDV monitoring

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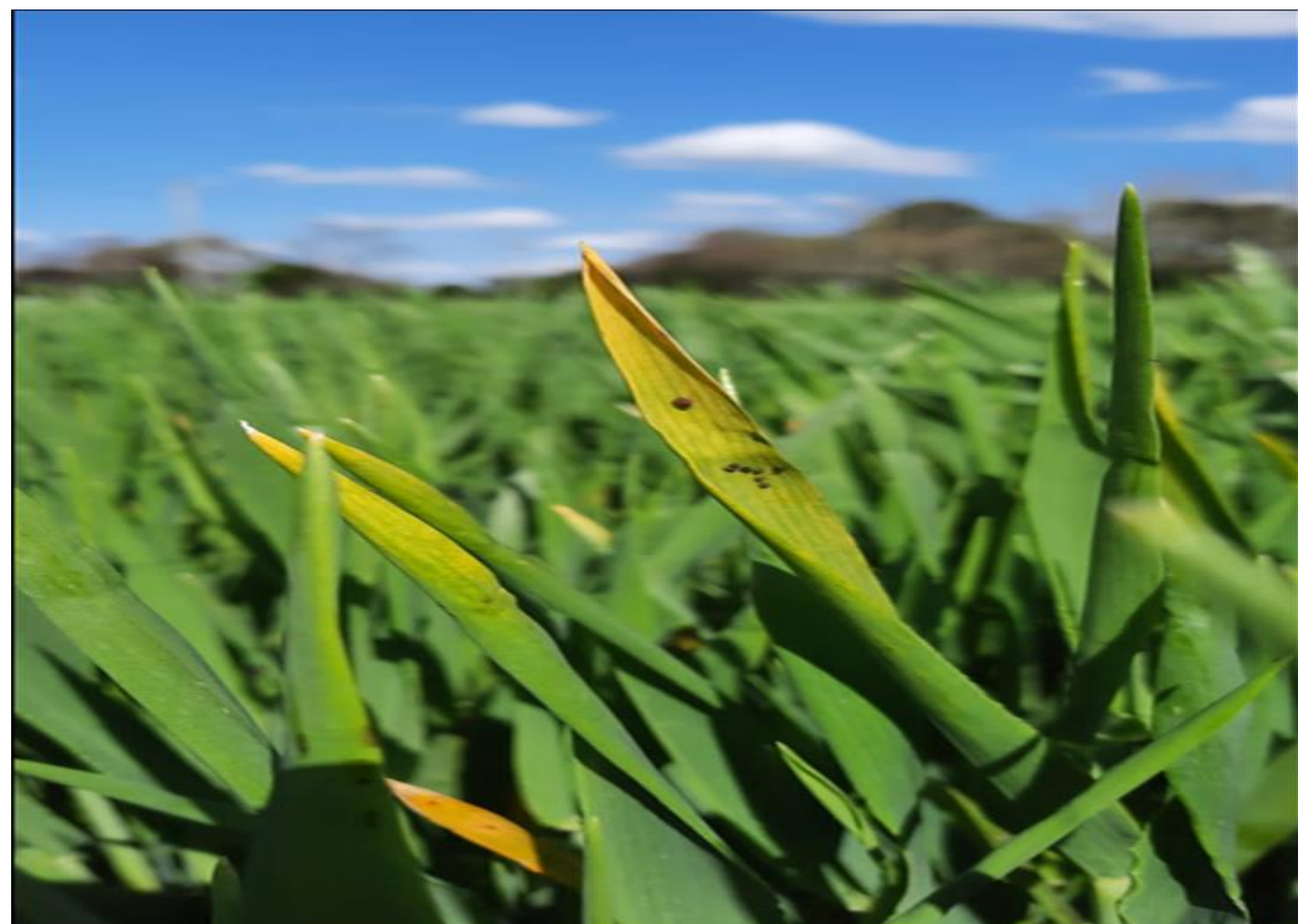
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Introduction

Aphids are major insect crop pests, reducing both grain yield and quality via direct feeding or vectoring plant viruses. In cereals the most economically important aphid vectored virus in cereals is barley yellow dwarf virus (BYDV), causing up to 80% yield losses (McNarmara *et al.*, 2020).



BYDV symptomatic barley crop, with aphids feeding on leaves

Challenges Facing Aphid Management

- Reduced insecticide availability
- Insecticide resistant populations of grain aphids
- Climate change
- No reliable thresholds for control

Aphid Monitoring

Insect monitoring is an important integrated pest management tool, enabling informed insecticide applications. Monitoring tools are applied for different scales; Visual assessments at plant level, Inception traps at field level and suction tower at region levels

The use of these monitoring tools require validation as the presence of an aphid however does not mean BYDV is present, the severity of BYDV infection is linked to both the number of aphids and the proportion of which are viruliferous (Holland *et al.*, 2022). This project will validate the different monitoring methods to determine whether they can be used to give an indication of aphid populations and BYDV pressure in the field to inform decisions to apply insecticides.



Aphid monitoring; visual searching (top left), yellow water trap (bottom left) and suction tower (right).

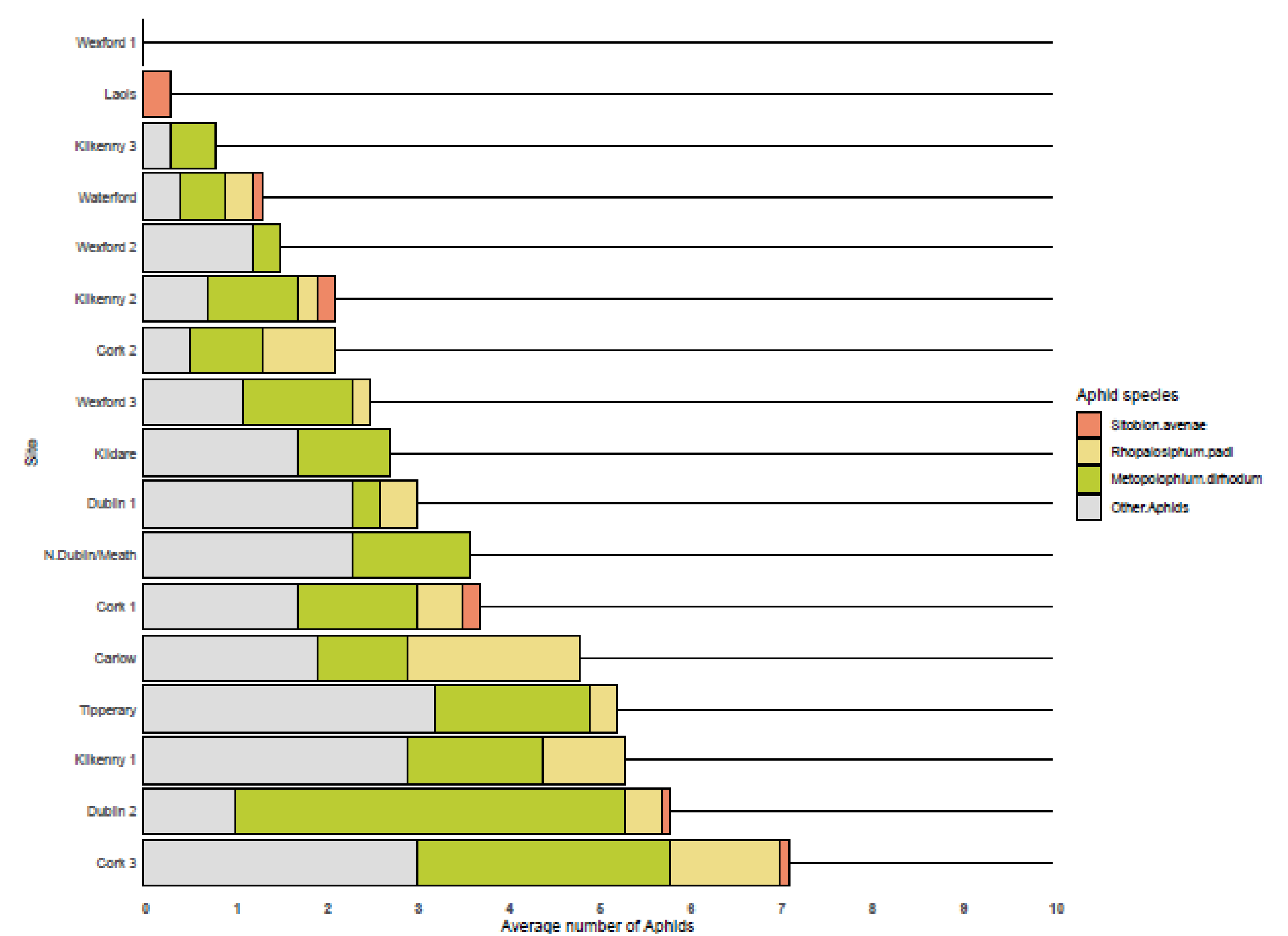
Yellow trap survey

Spring barley 2022 and Winter Barley 2022/23 Survey

17 Spring barley and 18 Winter barley growers across Ireland volunteered to take part and placed two yellow water traps in the field at 20m and 50m. Samples were posted to Teagasc, where the aphids are identified and tested for the virus. Each site is visited three times a growing season to carry out in-field visual aphid assessments and leaf sampling to test for virus.



Map 2022 spring barley (left) and 2022/23 winter barley (right) yellow trap survey sites



Average no. of aphids recorded across the 2022 spring barley yellow trap survey

Future Objectives

1. Validating Monitoring Tools

- Determine which monitoring tool is the best indicator of virus risk

2. Use of tolerant barley varieties

- Test ability of tolerant varieties to control BYDV in Ireland
- Determine if tolerant varieties require insecticide applications

3. Testing a novel decision support tool (DST)

- Tram line trials to test if this DST is suitable for Ireland

References

- Holland, J.M., McHugh, N.M. and Salinari, F. (2021) 'Field specific monitoring of cereal yellow dwarf virus aphid vectors and factors influencing their immigration within fields' *Pest Management Science*, 77, pp. 4100 – 4108.
- McNamara, L., Walsh, L., Gaffney, M. and Jacquot, E. (2020) 'Management of yellow dwarf disease in Europe in a post-neonicotinoid agriculture'. *Pest Management Science*, 76, pp. 2276 – 2285.