UPOV
International Union for the Protection of New Varieties of Plants

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Technical Working Party on Testing Methods and Techniques **TWM/1/7 Add.**

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ADDENDUM TO COMBINED-OVER-YEAR UNIFORMITY (COYU) CRITERION: EXTRAPOLATION

Document prepared an expert from the United Kingdom

The Annex to this document contains a copy of a presentation on “Combined-over-year uniformity (COYU) criterion: Extrapolation”, prepared by experts from the United Kingdom, to be made at the first session of the TWM.

[Annex follows]

COYU: extrapolation

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Overview

- What is extrapolation?
- Why is it important?
- Extrapolation under old and new COYU methods
- Flagging cases of extrapolation
- What to do in cases of extrapolation?
- Next steps

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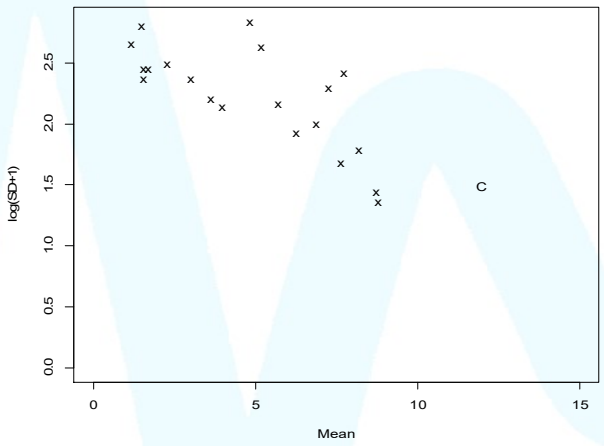
What is extrapolation?



Reminder: COYU uses a calculated relationship between plant-to-plant variability and mean scores (TWM/1/8)

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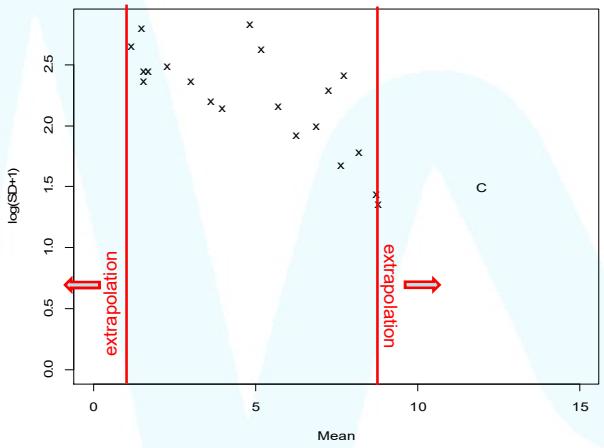
What is extrapolation?



Reminder: COYU uses a calculated relationship between plant-to-plant variability and mean scores (TWM/1/8)

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Why is extrapolation important?

We need to compare uniformity with similar varieties

TG/1/3 General Introduction

6.4.2.2.1 For measured characteristics, the acceptable level of variation for the variety should not significantly exceed the level of variation found in comparable varieties already known .....

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Why is extrapolation important?

COYU works using a calculated relationship between plant-to-plant variability and the mean

- The calculated curve can be extrapolated for both old and new methods
- But speculative!
- The two methods extrapolate differently

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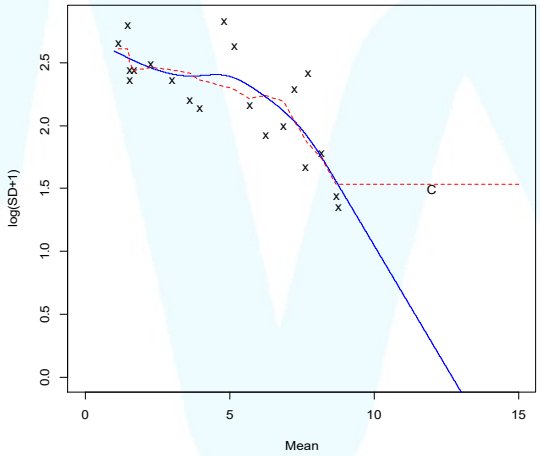
Extrapolation under old and new COYU methods

Extrapolated lines



Red line = old method (moving average)

Blue line = new method (spline)

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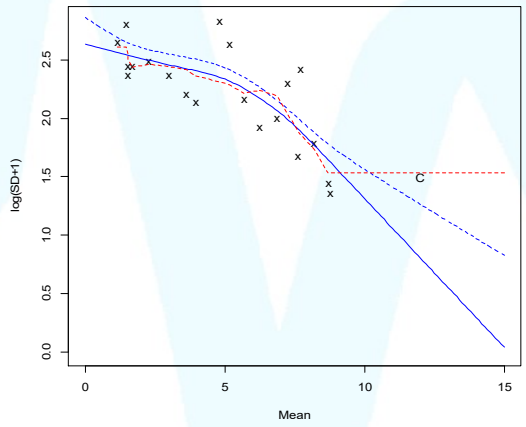
Extrapolation under old and new COYU methods

New method allows for increasing uncertainty



Red line = old method (moving average)

Blue line = new method (spline)

Dashed line = one standard error above spline

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Flagging cases of extrapolation

Strict definition:

Flag if candidate mean outside the range of reference varieties

- Too many cases in some crops (e.g. perennial ryegrass 13%, TWC/35/6)
- Not necessary:
  - A little outside the range, can still make good decisions with COYU

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Flagging cases of extrapolation

A more practical solution:

Flag if candidate mean is too far outside the range of reference varieties

- Extrapolation index:
  - compares uncertainty for candidate with the nearest reference variety
  - > 1 ⇨ strict extrapolation
  - Higher when further out (or fewer reference varieties)
- Select a threshold for extrapolation index
  - Higher values flagged as extrapolation

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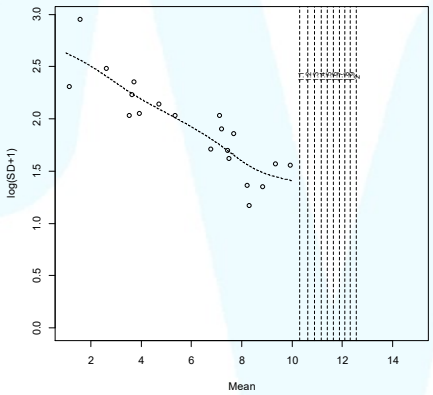
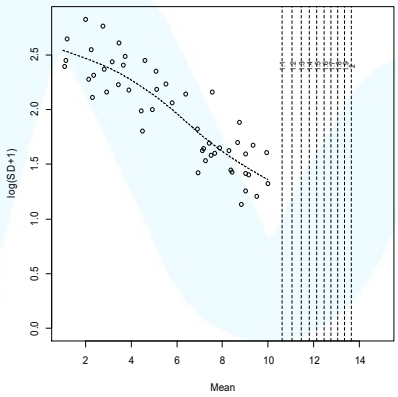
Flagging cases of extrapolation

20 reference varieties



50 reference varieties



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Flagging cases of extrapolation

Setting a threshold:

Case study: UK, historical data, 105 candidates, 4640 cases

Extrapolation index threshold	Cases with extrapolation	Candidates with extrapolation in any characteristic
1 (= strict extrapolation)	8.4%	67%
1.1	3.8%	38%
1.2	2.3%	30%
1.3	1.5%	27%
1.4	1.0%	17%
1.5	0.9%	14%

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What to do in cases of extrapolation?

Replace calculations with expertise

Considerations

- Degree of extrapolation
- Is it likely that the trend seen in the reference varieties would extend to the candidate mean
- What is the situation in other cycles

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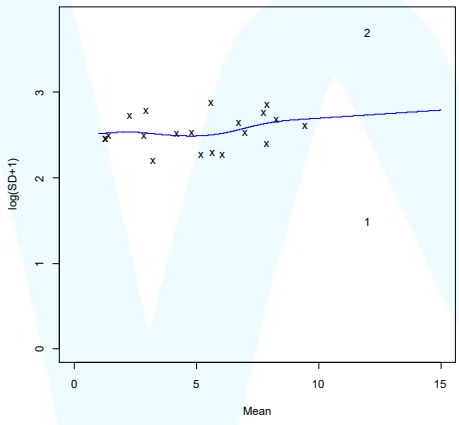
What to do in cases of extrapolation?

Case 1



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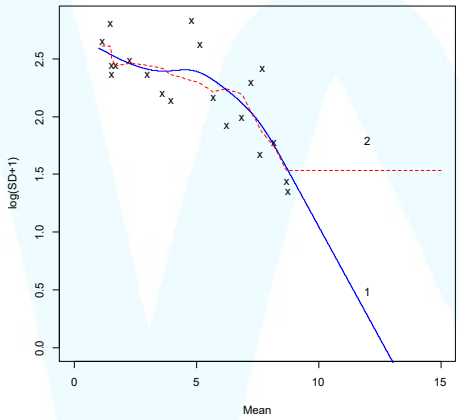
What to do in cases of extrapolation?

Case 2



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Next Steps

It is important to recognise the issue of extrapolation, present even with old COYU but not flagged

Need to:

- Identify threshold for extrapolation index
  - Implement in software
- Draft guidance
  - Especially on how to make decisions

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Next Steps

Discussions needed

- Contributions welcome
- UK to have an internal workshop to make proposals

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Thank you for your attention!

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[End of Annex and of document]