Winter wheat based rotations – Agronomic evaluation of IPM strategies in on-station experiments

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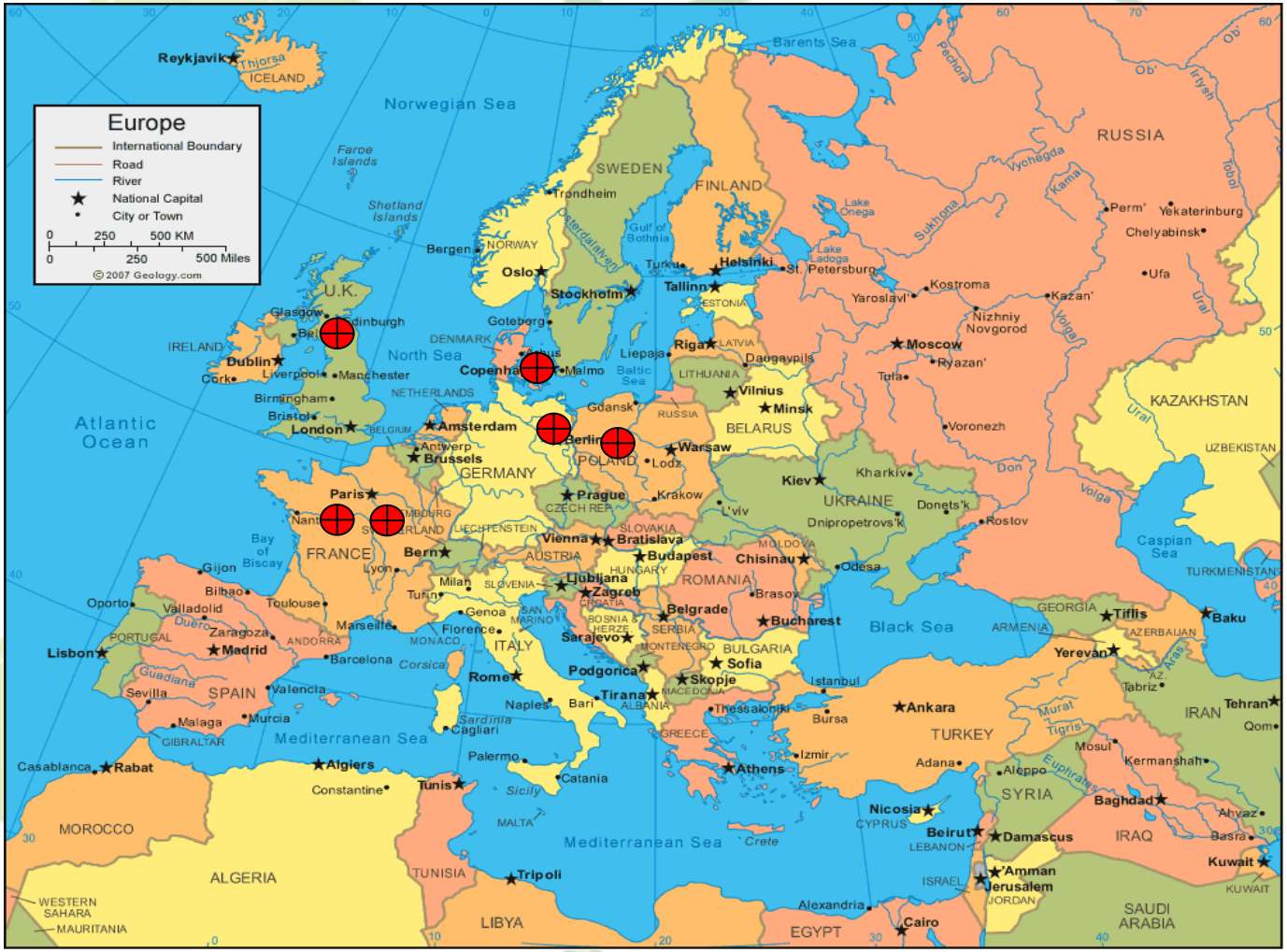
Location of on-station trials



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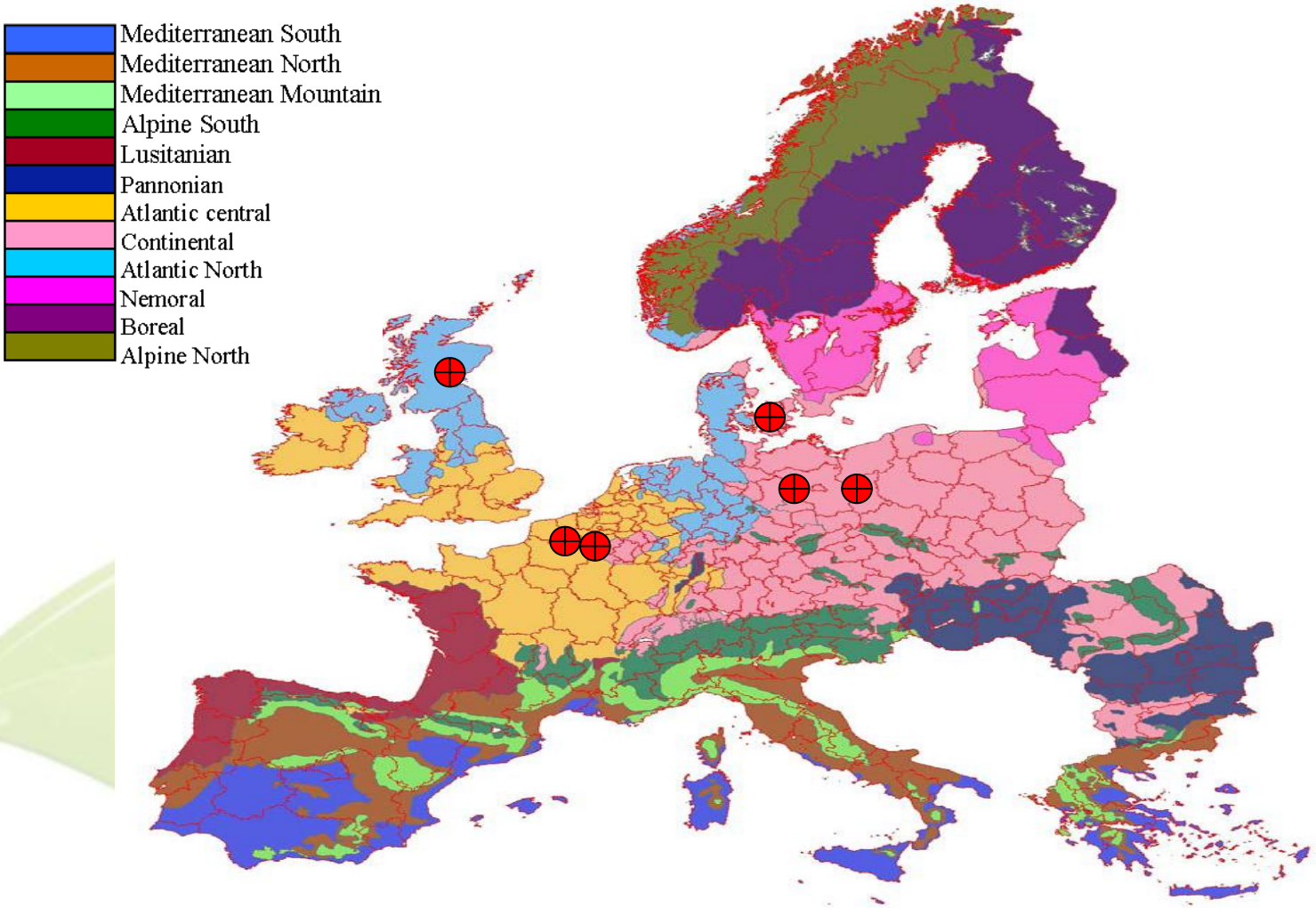


Experimental approach

- Four new long-term experiments were initiated in D, DK, PL and UK
- Existing experiments were used/modified in F (INRA at Versailles and Arvallis at Boigneville)
- Comparing current practice (CP) to two levels of IPM (intermediate (IM) and advanced (AD))

Trial design

- Trials in D, DK, PL were 3-year rotations, small-plot experiments, all crops every year
- Trial at INRA in F was a 4-year (CP), 5 year (IM) and 6-year rotation (AD), two locations, large plots (4000 m2), AD was no pesticides, all crops not cultivated every year
- Trial at Arvalis in F was 4-year (CP & IM) and 7-year rotation (AD), large plots (hectares), AD was organic+perennial crop, all crops cultivated every year
- *Ex-ante* analysis using DEXiPM

Treatments

- Current practice
  - Good agricultural practice (primarily winter annual crops, pest monitoring, use of optimized pesticide doses)
- Intermediate IPM
  - Crop diversification, cultural practices, disease resistant varieties, non chemical weed control methods etc.
- Advanced IPM
  - As intermediate IPM + cover crops, forecasting models + innovative tools

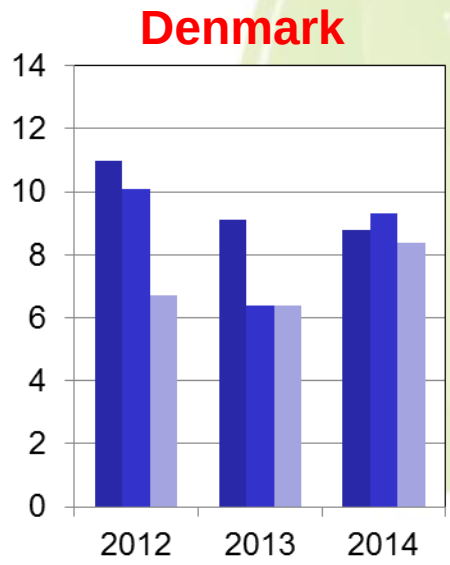
IWM tools

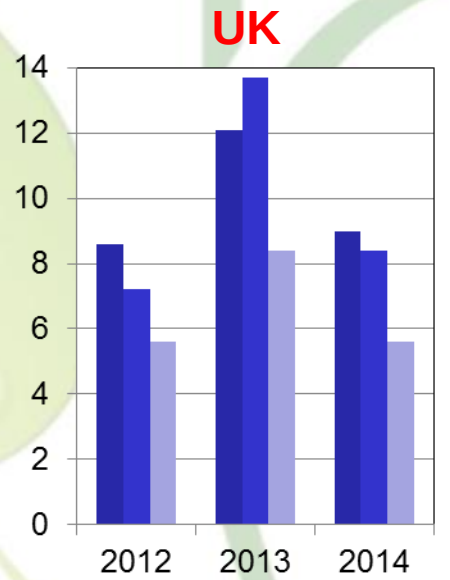
- Weeds
  - Crop diversification, seeding rate, delayed sowing, false seed bed, harrowing, interrow cultivation, herbicide decison support system
- Diseases
  - Resistant varieties, variety mixtures, forecasting models, biological control methods, elicitors, electron seed treatment
- Insect pests
  - None

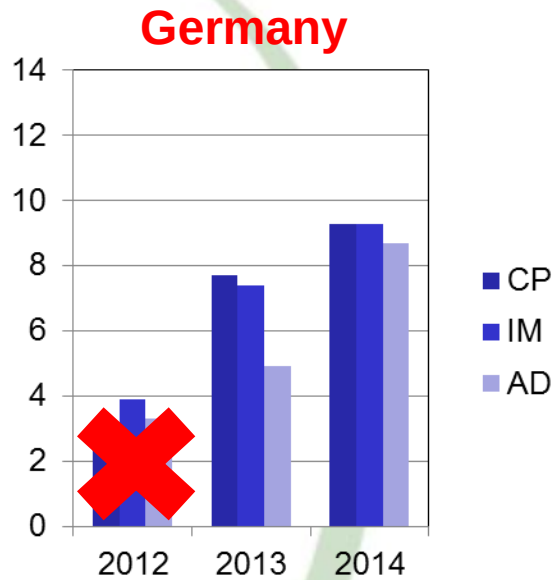
Pest control

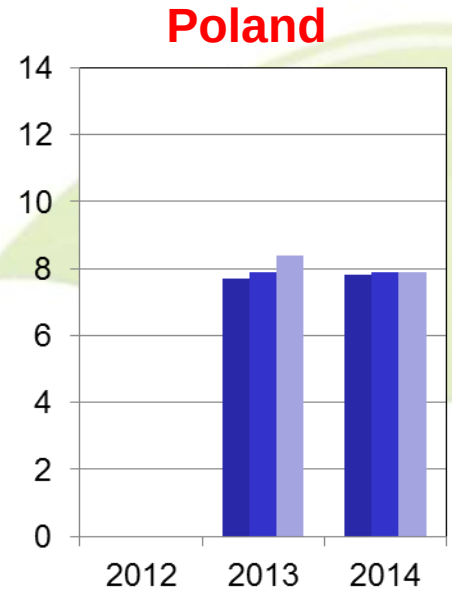
- General good control of weeds, diseases and pests in the CP and IM systems
- Lower and more variable effects in the AD system in some locations in some years but no general trends
- Weed flora shifts have occured in the French trials and are becoming apparent in the Polish trial
- More detailed statistical analyses will be done

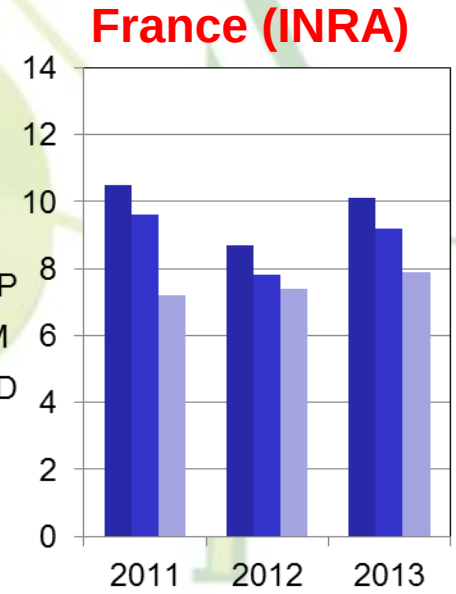
Winter wheat yields (t/ha)

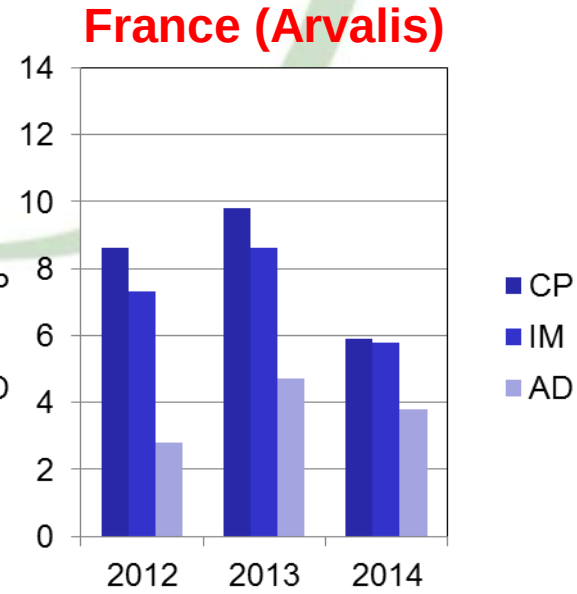












Yields

- Winter wheat yields generally highest in the CP system
- Winter wheat yield losses in the IM and AD systems varied between locations and years
- Yield differences smaller for break crops (OSR, winter barley and maize) than for winter wheat.

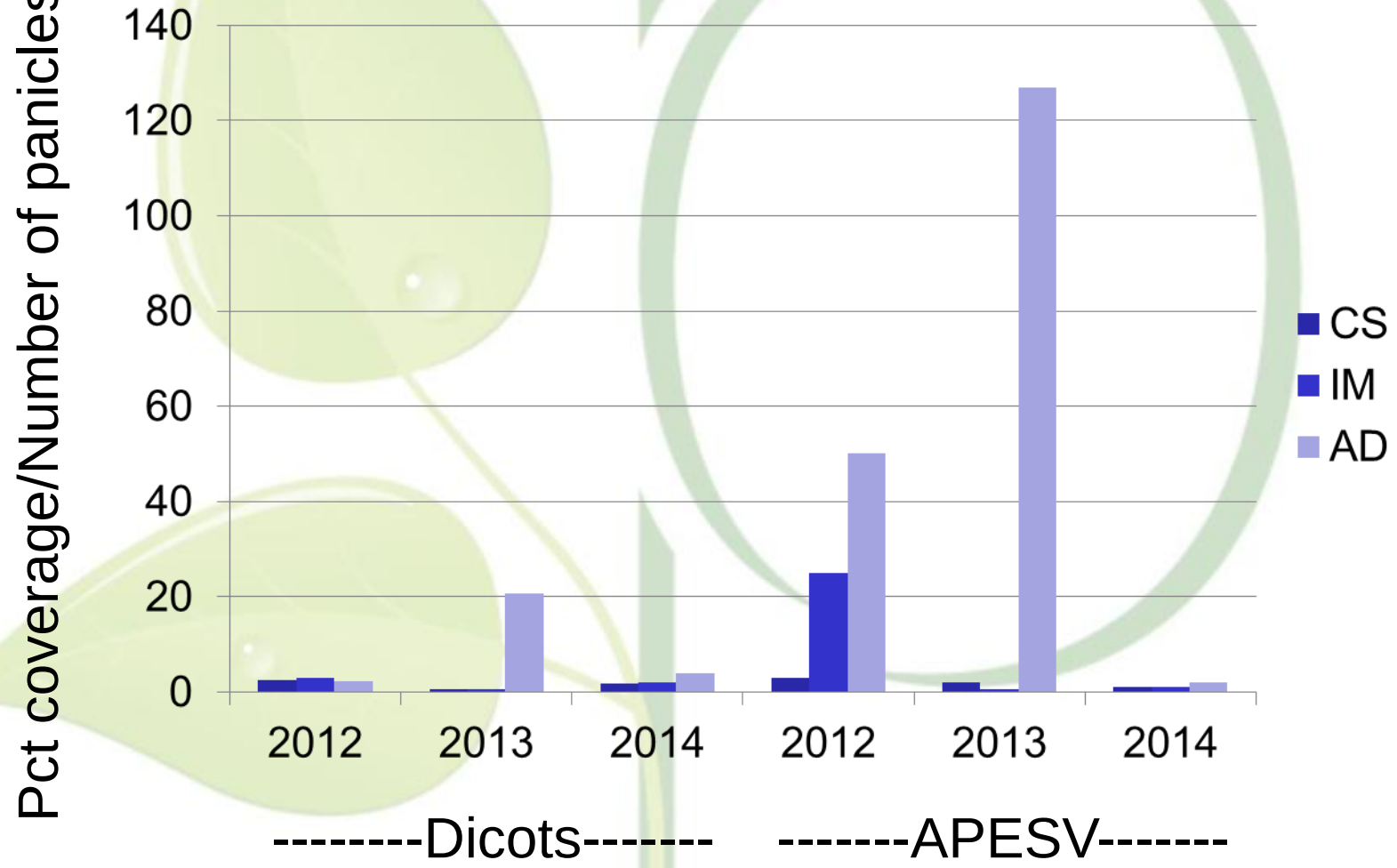
IPM tool: Mechanical weeding

Interrow cultivation ☺

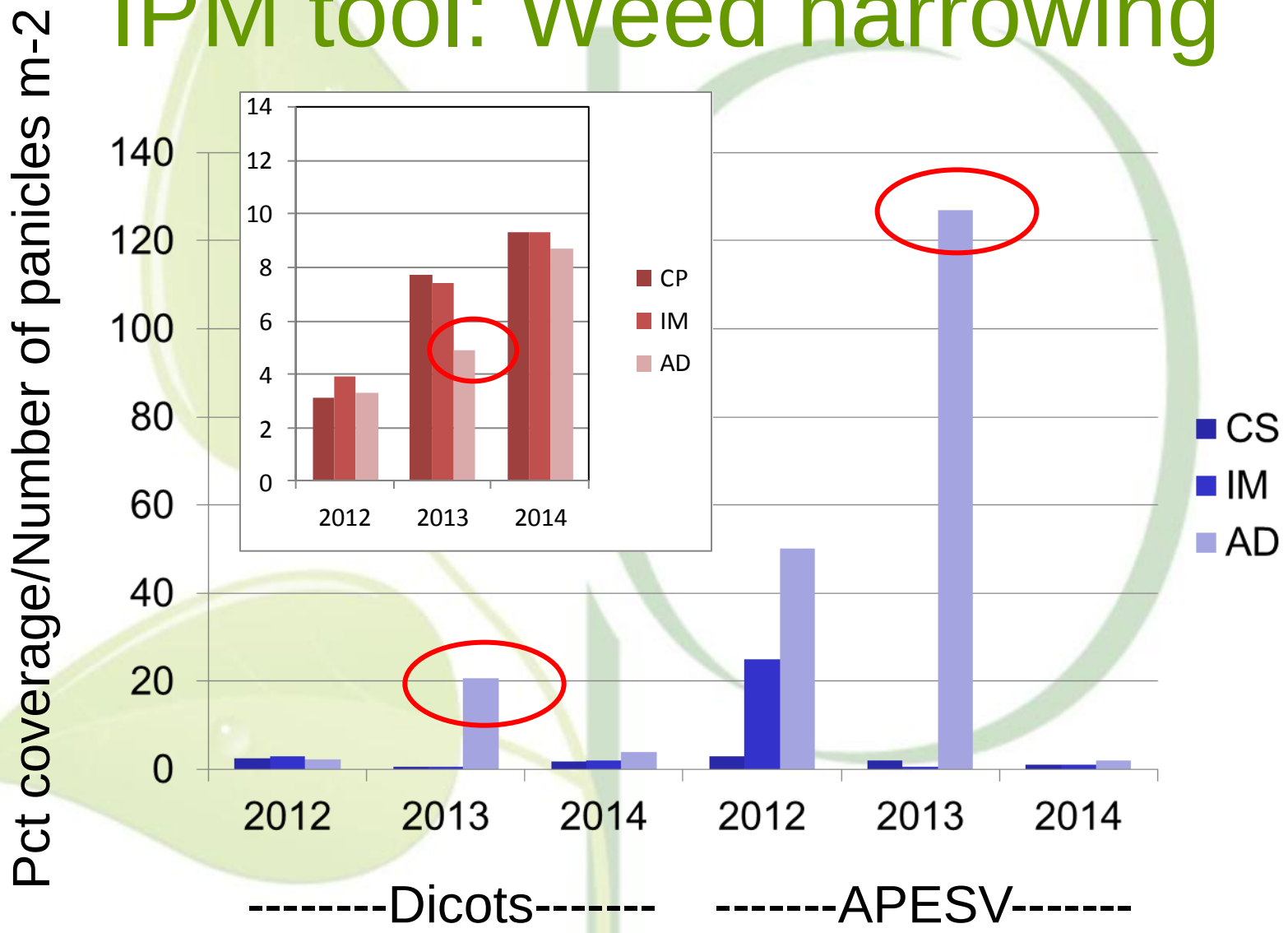


Weed harrowing 😐

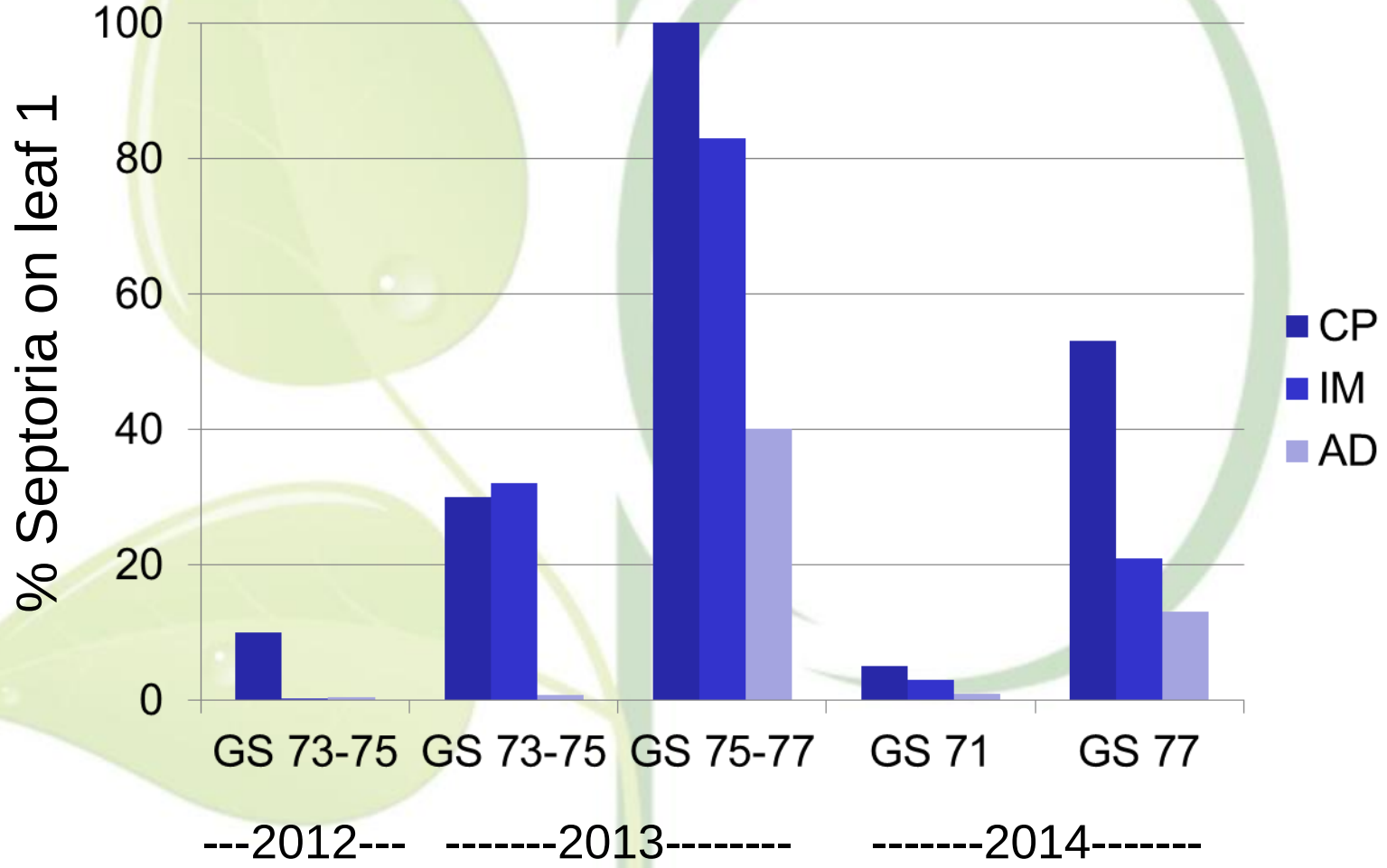

IPM tool: Weed harrowing



IPM tool: Weed harrowing



IPM tool: Variety mixtures



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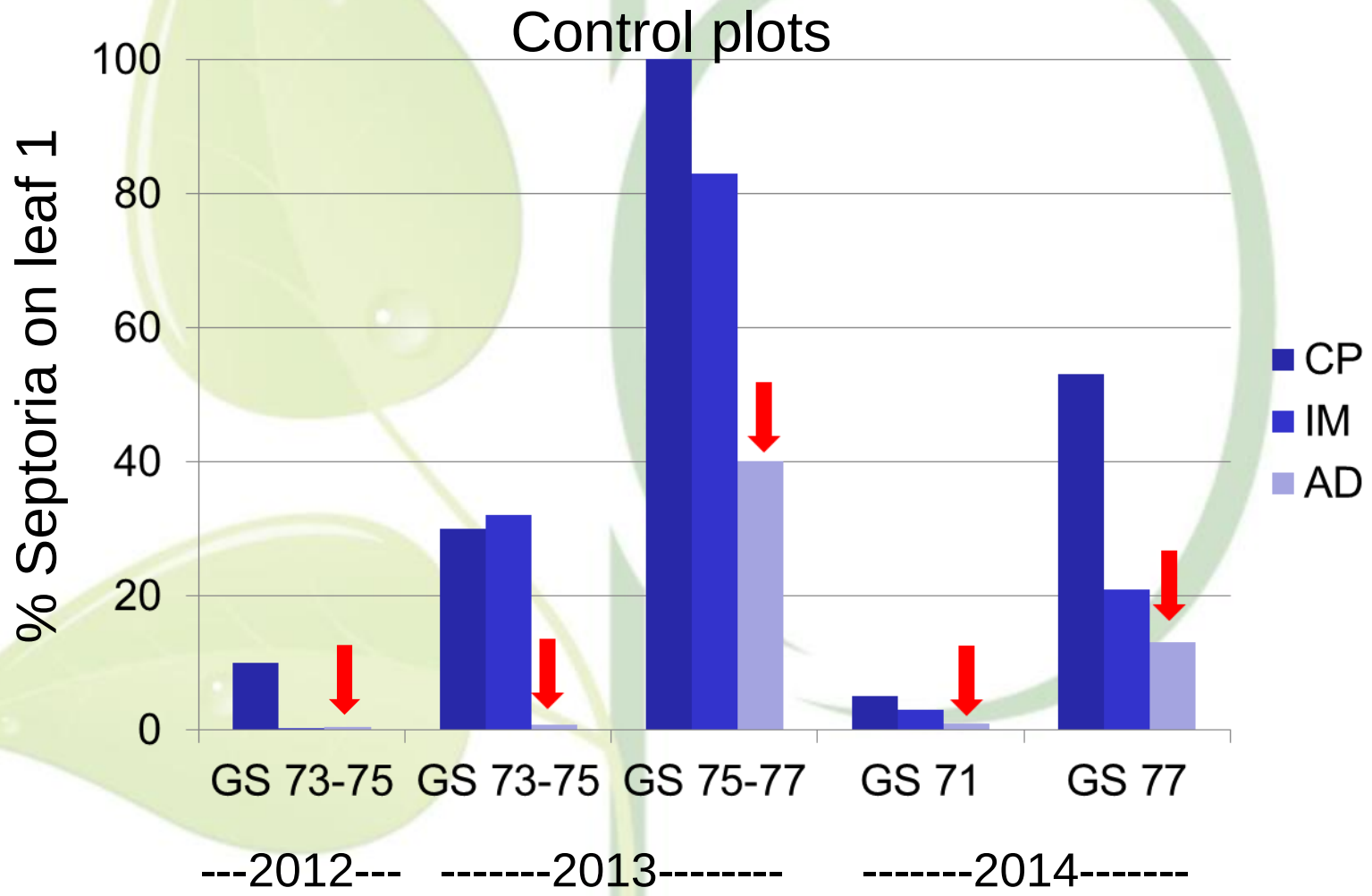

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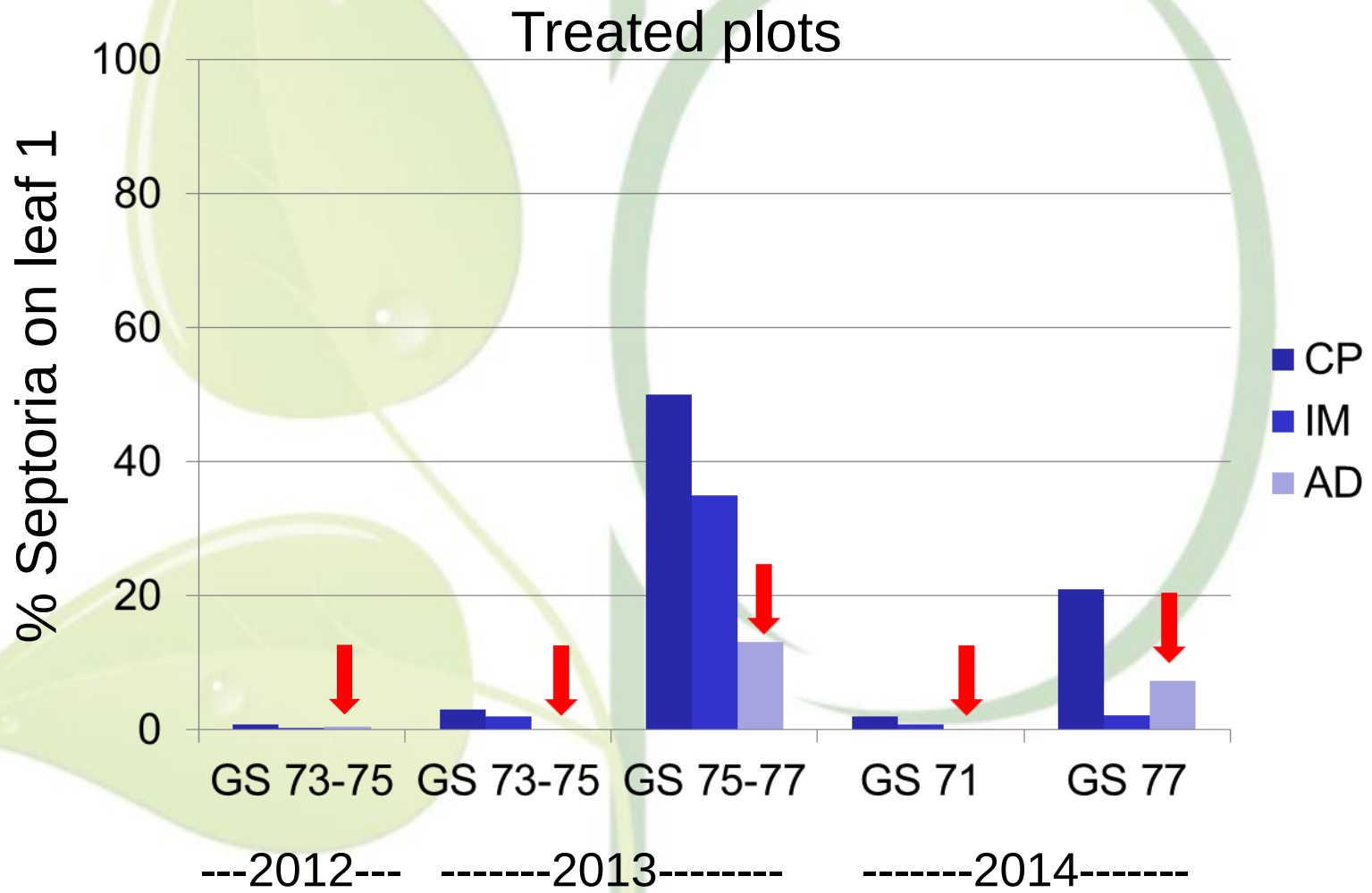
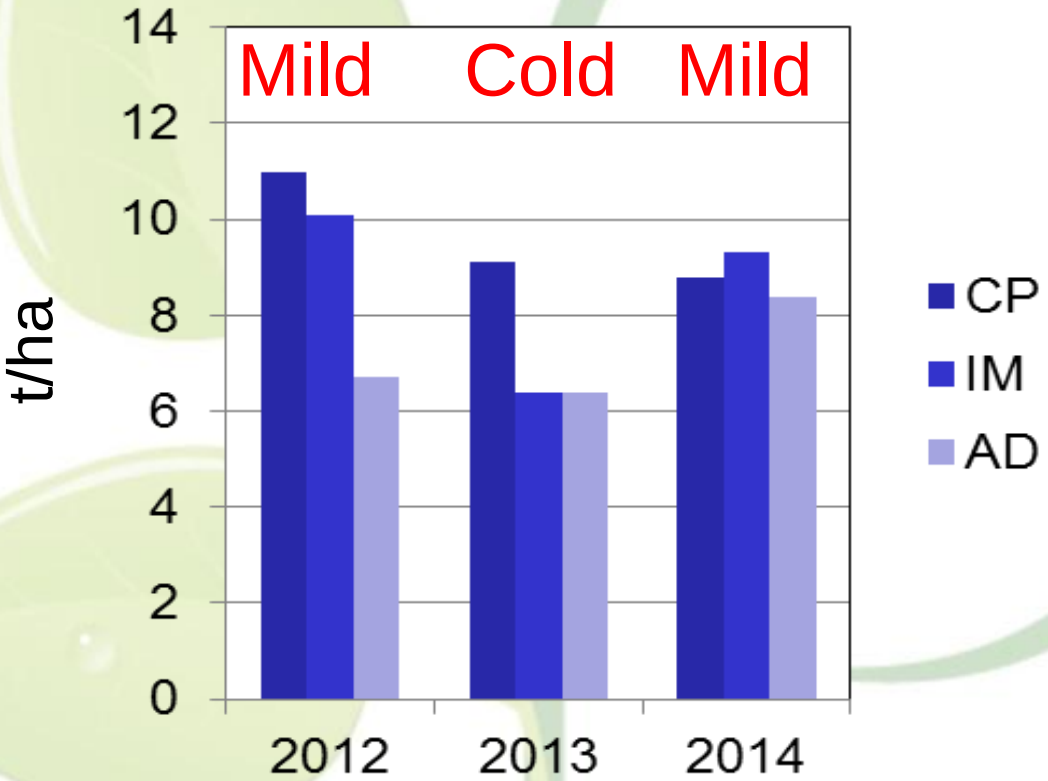


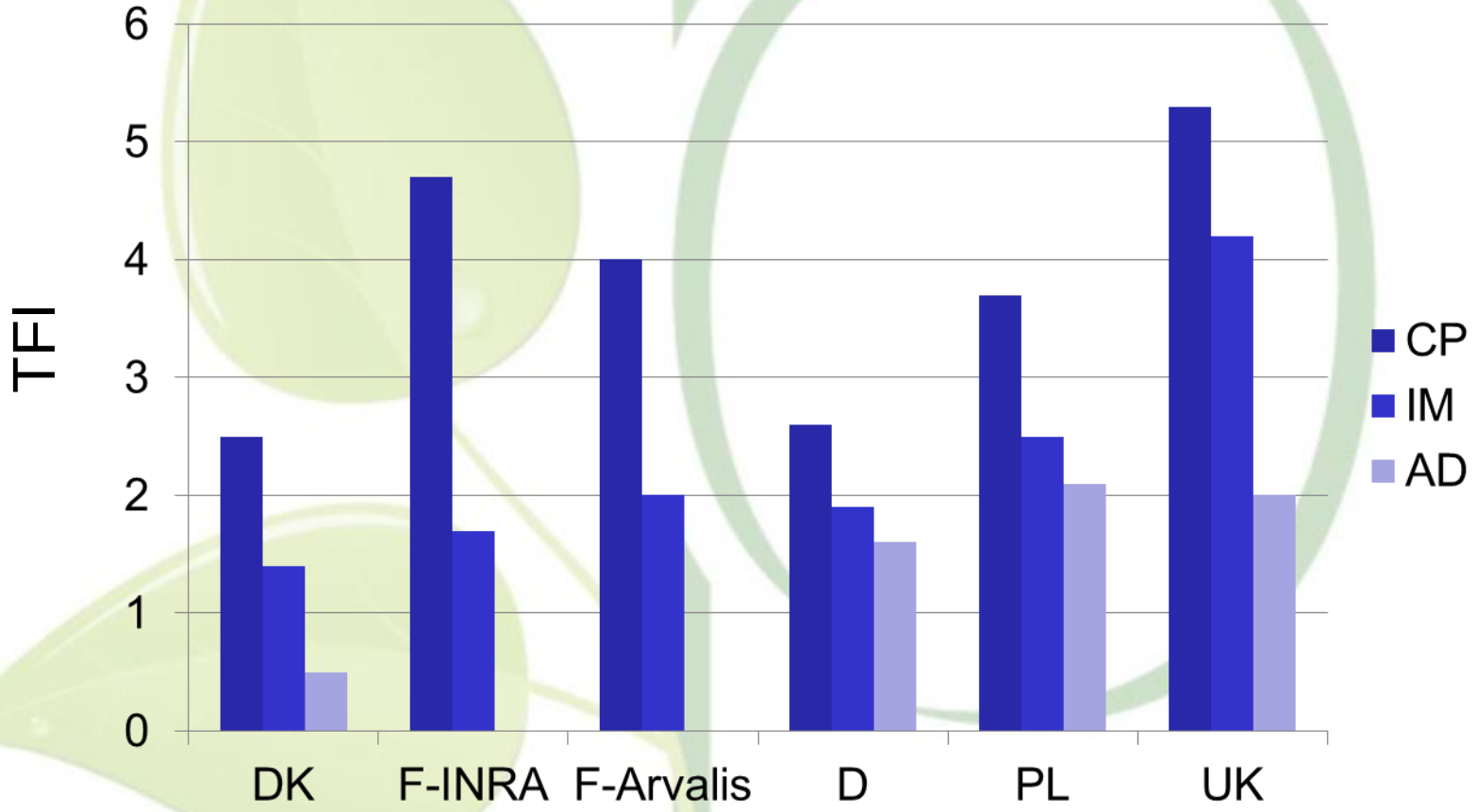
IPM tool: Variety mixtures

	Untreated	Treated
Current Susceptible variety		
Intermediate Resistant variety		
Advanced Variety mixture		

IPM tool: Delayed sowing



Pesticide use



Thank you for your attention!

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