

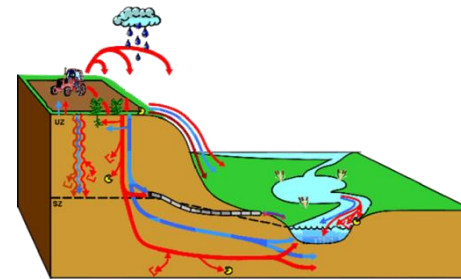
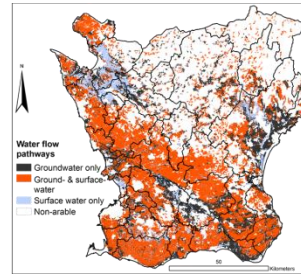
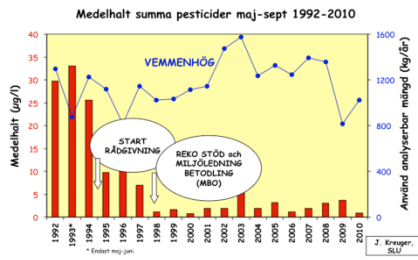
Pesticide monitoring provides incentives for regulations and collaborations

Mikaela Gönczi

Director SLU Centre for Pesticides in the Environment (CKB)

The aim of CKB

- CKB is a national centre of expertise in how the use of chemical pesticides in agricultural areas affect the environment
- CKB acts as a collaborating organ for researchers and departments at SLU and interested parties outside the university
- CKB was established in 2007 at SLU

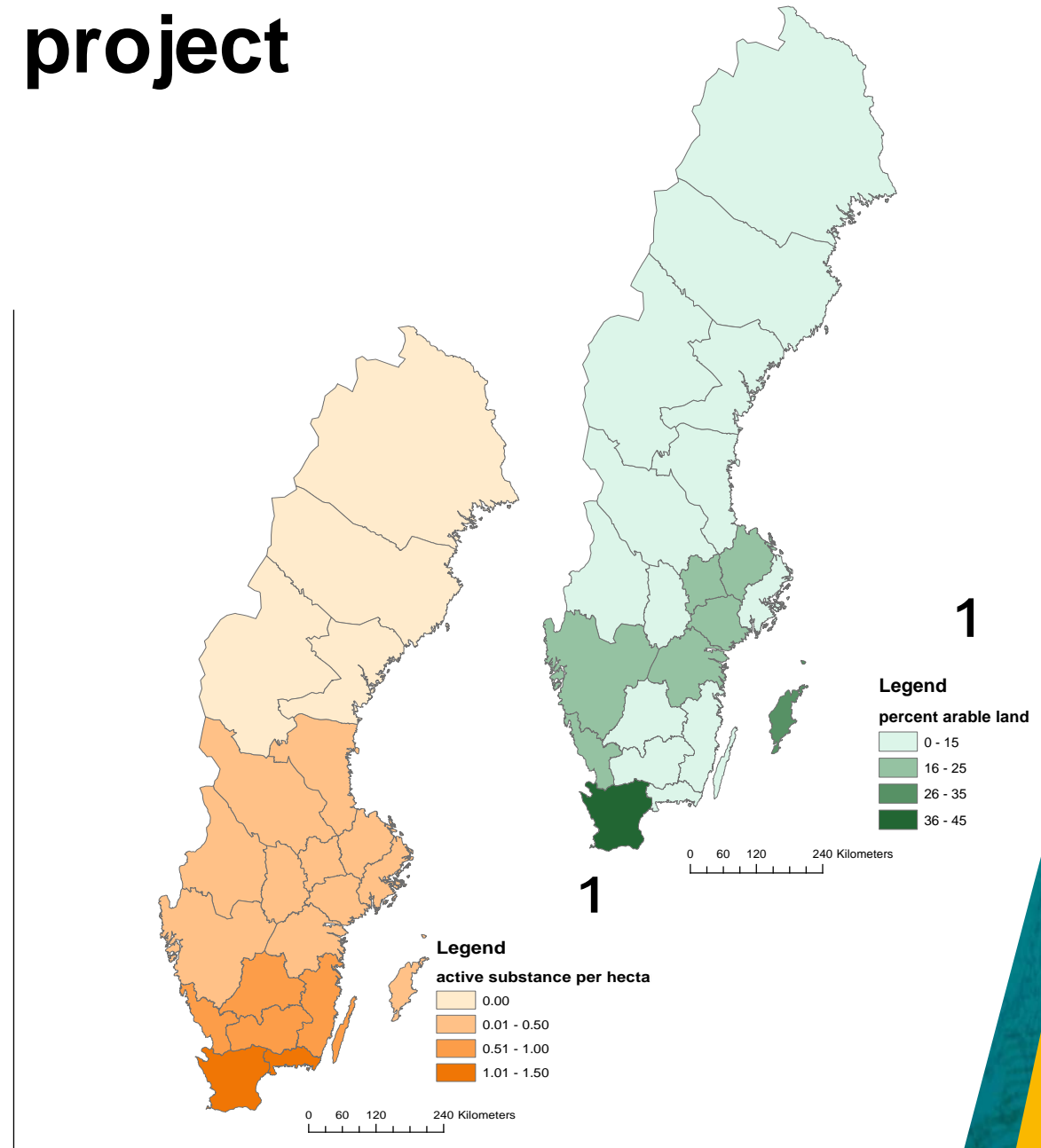


Today, two examples on how monitoring data has been used to manage the risks of pesticides contaminating the environment



The Vemmenhög project

- Started in 1990 by Jenny Kreuger, SLU, and agricultural adviser Eskil Nilsson
- Skåne county: >50% of the total amount of pesticides sold in Sweden is applied here
- Vemmenhög, a small catchment with 90% arable land



The Vemmenhög project

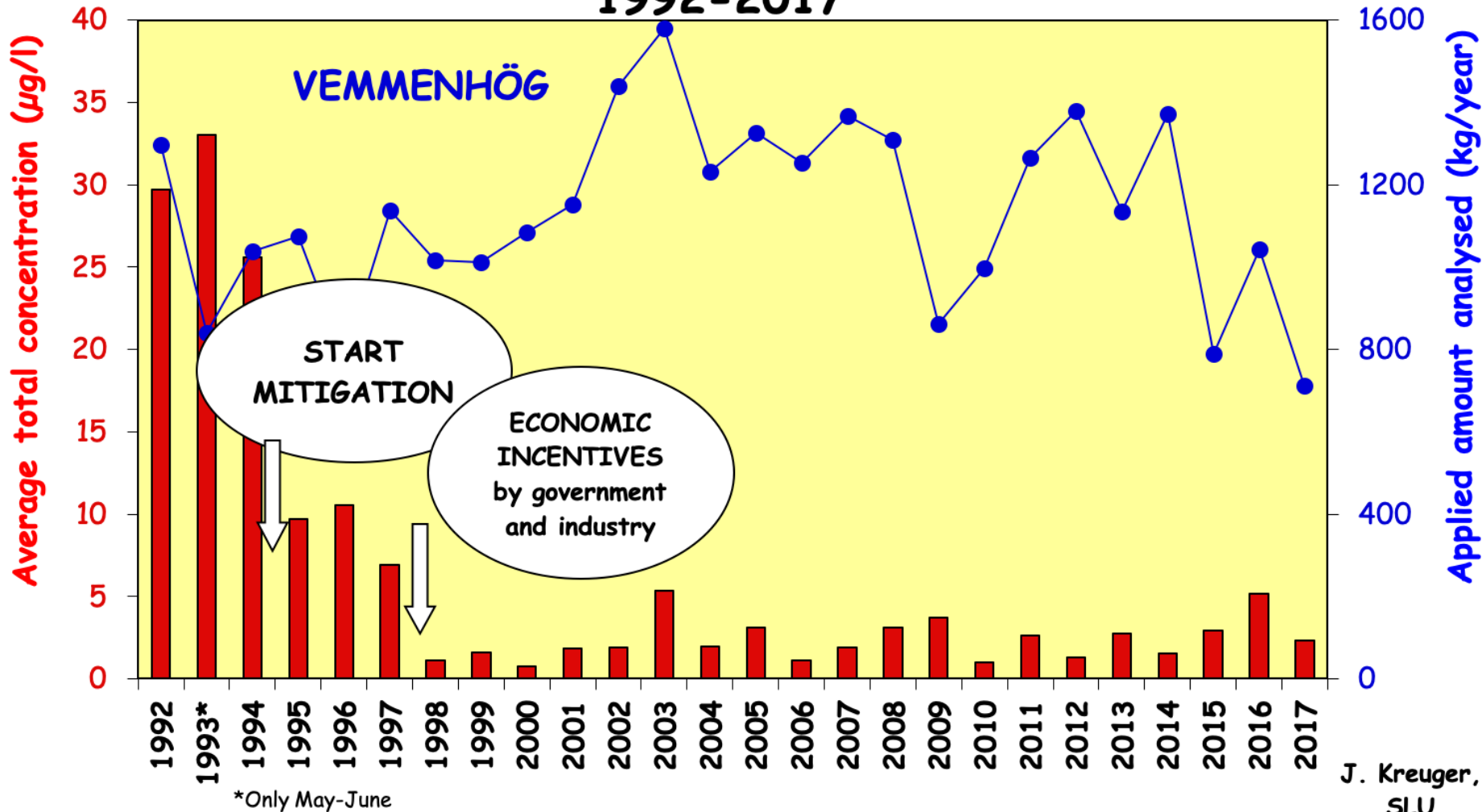
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- Investigate transport of pesticides to surface waters
- Close co-operation with the farmers
- Detailed information from the farmers on crops, fertilisers and pesticide use
- Intensive monitoring
- Analytical method development

Results from the Vemmenhög project

Average total pesticide concentration May-Sept
1992-2017

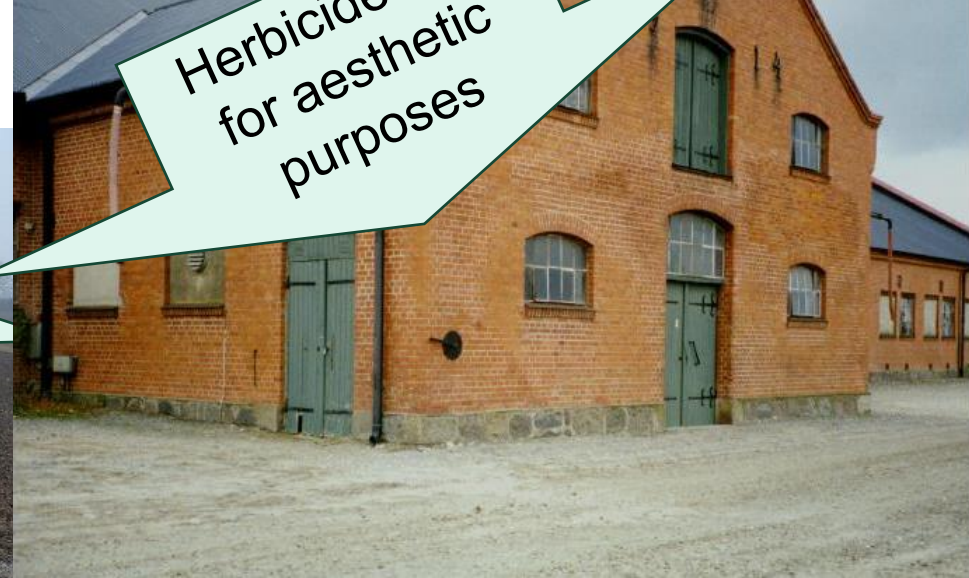


- 90% reduction in pesticide concentrations

Point sources



Point
source



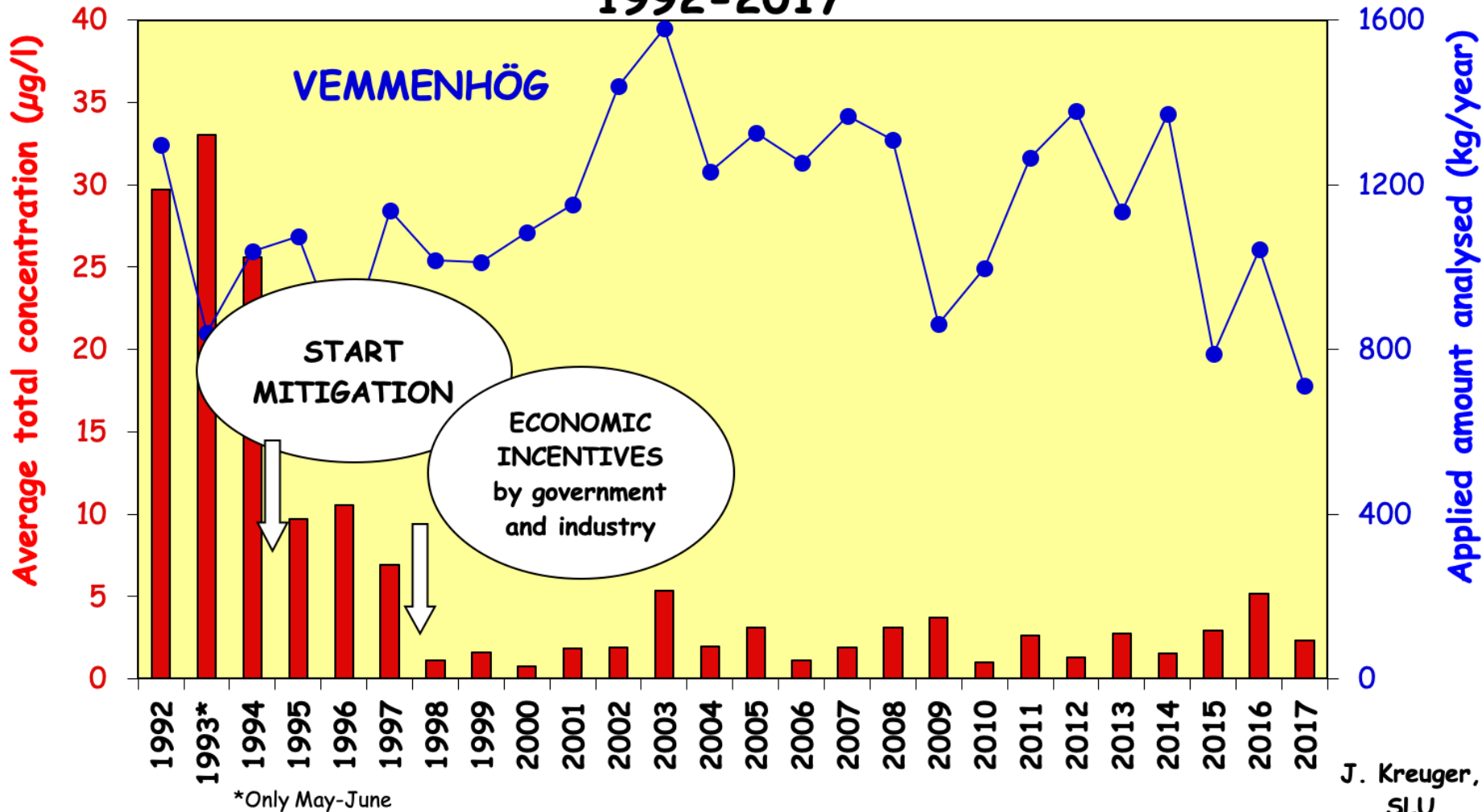
Herbicide use
for aesthetic
purposes



Refilling of
sprayer on
bioactive soil

Results from the Vemmenhög project

Average total pesticide concentration May-Sept
1992-2017



- 90% reduction in pesticide concentrations
- No change in used amount

What happened after the Vemmenhög project?

- The Swedish EPA gave regulations on the use and handle of pesticides 1997, referring to Vemmenhög
- More detailed guidance and recommendations, education and advises – voluntary work by farmers
- National pesticide monitoring program at SLU, financed by Swedish EPA, started in 2002
- In 2007 an EU directive on sustainable use of pesticides
- In 2015 legally binding in Sweden by new regulations from the EPA

The Diflufenican campaign

Diflufenican - luring i vattenmiljön

2018 - 2020

“Safe Pesticide Management”



Fynd av diflufenican i ytvatten överskrider förhållandevis ofta det uppsatta riktvärdet. Högst halt uppmäts under senare delen av hösten, då också flest bekämpningar görs. Foto: Tilla Larsson

Antalet godkända ogräspreparat i Sverige är stort, men deras verkningsmekanismer är klart mer begränsade. Diflufenican är ett av de ämnen som är viktigt ur ett resistensperspektiv. Dilemmat är att ämnet hittas förhållandevis ofta i vattendrag, där det såklart inte hör hemma. Detta behöver vi gemensamt göra något åt!

Unikt verknings sätt

Diflufenican (DFF) ingår som ett viktigt ämne och resistensbrytare i ogrässtrategier. DFF är det aktiva ämnet i preparat som Diflanil 500 SC, Legacy 500 SC och Semptra. Det finns också flera produkter, exempelvis Saracen Delta och Othello OD, där DFF ingår som ett av två eller flera aktiva ämnen.

DFF är särskilt viktig i höstsäd, eftersom höstbehandlingar har bra effekter på vanliga, höstgroende ogräs-

arter, som viol, veronika och plister. Särskilt viktig är också effekten på resistensutsatta ogräs som våtarv, baldersbrå, kamomill, blåklint och vallmo.

DFF är för närvarande helt ensam om sitt specifika verknings sätt. Förloras möjligheten att använda DFF, är risken stor att ännu fler ogräs kommer att utveckla resistens mot ämnen i de vanligast förekommande ogräspreparaten, ALS-hämmare (lågdosmedel).



Samarbete för att minska läckage av växtskyddsmedel till vattendrag

NYHETER 2018-06-20

Ingen vill att ogräsmedel ska läcka ut i våra vattendrag. Samtidigt är det viktigt att vi kan producera livsmedel på ett hållbart och lönsamt sätt. Därför startar samarbetsorganet Säkert växtskydd en informationskampanj som syftar till att lantbrukarna i södra Sverige ska minska risken för läckage av ämnet diflufenican till ytvatten.



Europeiska jordbruksfonden för landsbygdsutveckling: Europa investerar i landsbygdsområden

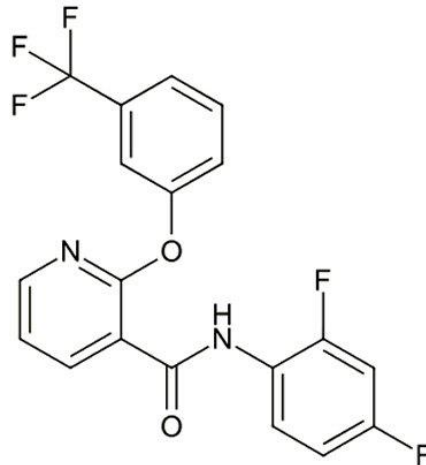


info@sakertvaxtskydd.se

<https://www.sakertvaxtskydd.se/aktuellt/dff-kampanjen-har-pagatt-i-tre-ar/>

What is diflufenican – DFF?

- A widely used herbicide used in Sweden since 1993
- Used mainly in grain in the autumn
- Important because it works on weed that is resistant to other pesticides
- BUT often detected above the Environmental Quality Standard in surface water pesticide monitoring (SLU)



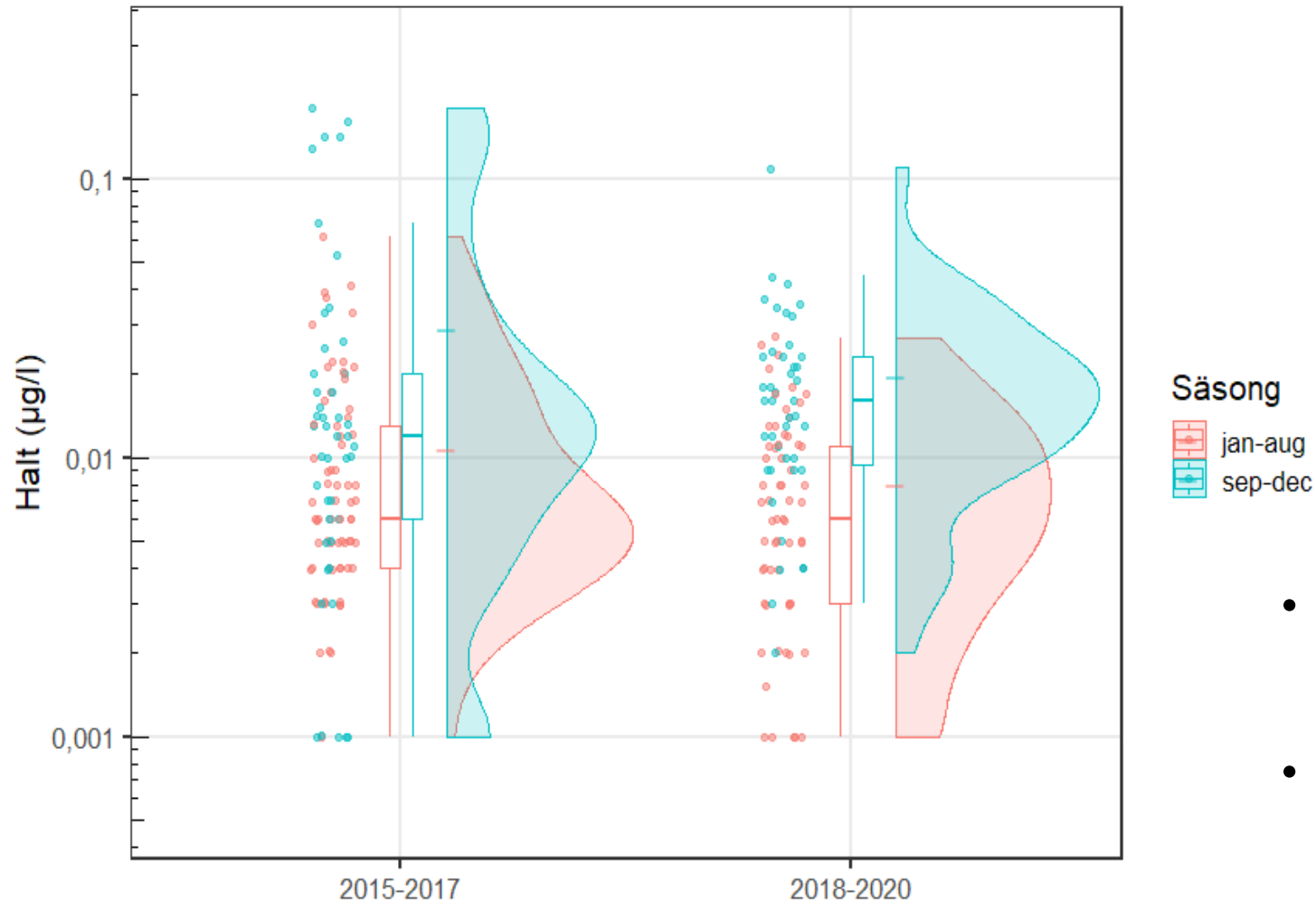
The aim of the campaign

- Give the farmers the possibility to work with voluntary measures to reduce the concentrations of DFF
- Different strategies were recommended:
 - Bigger spray free zones to streams/ditches/around wells
 - Extra careful at clay soils (higher risk for leakage)
 - Move some of the treatments from autumn to spring
 - Reduced use (lower dose, not the whole field/not all fields)
- If it works – DFF can still be used in the future

Has it worked?

- CKB did an evaluation (on behalf of the Swedish Plant Protection Council, financed by the Swedish Board of Agriculture) based on data from the national monitoring program
 - Weekly average concentrations of DFF in surface waters
 - Information from the farmers on use of DFF (time, place and dose)
- Questions:
 - Has the concentrations and the use decreased during the campaign?
 - What are the important factors for losses of DFF to surface waters?

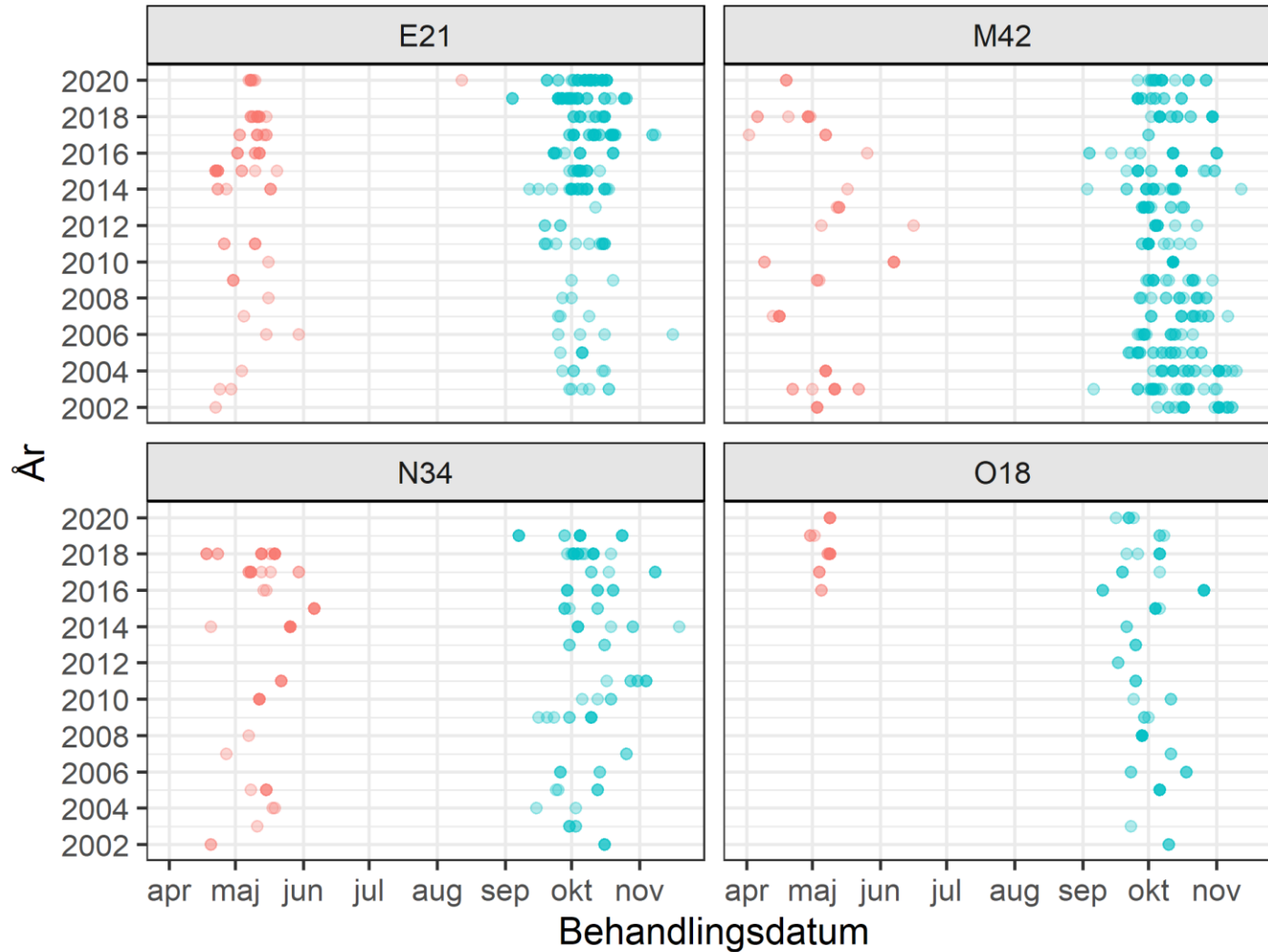
Concentrations of DFF before vs during the campaign



**Concentrations from the
model cathment in Skåne**
Statistical model: *generalized
least squares*

- No difference in concentrations of DFF 2015-2017 vs 2018-2020
- Statistically higher concentrations in the autumn

Use of DFF



- Highest use of DFF during the autumn

Säsong

- jan-aug
- sep-dec

- No reduced use during the campaign

Statistical analysis – important factors for DFF

Based on monitoring results the most important factors for DFF concentrations are:

- Flow in the stream, precipitation and soil conditions
- Total amount DFF used in the catchment
- Higher risk when applied in the autumn

What happenend after the DFF campaign?

- The campaign continues
- Three years is too little to see any changes (a lot of natural variation due to climate etc.)
- Recommendations refined after CKB analysis
- DFF is under re-registration at EU level
- Final report from CKB published in June 2021 (summary in English)
 - Utvärdering av effekter av diflufenikankampanjen 2018 – 2020 - Styrande faktorer för uppmätta halter av diflufenikan i ytvatten. CKB rapport 2021:1
- Big interest of our monitoring data!
- Data from 2021 is promising! Decrease in concentrations and use

Thanks for listening!

Questions?

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