

Wat eten we vandaag

Symposium Bijengezondheid - WUR

15 October 2022, Harmen Hendriksma



WAGENINGEN
UNIVERSITY & RESEARCH

1997 – 2004

Student Biologie

Wageningen University

2004 – 2008

Bijenhouder (Honing en Bestuiving)

Bfactory, Rhenen

2008 – 2010

PhD Environmental Risk Assessment honing bijen

University of Bayreuth

2010 – 2012

PhD Environmental Risk Assessment honing bijen

University of Würzburg

2012 – 2015

Postdoc bijengedrag en voeding

Hebrew University of Jerusalem

2015 – 2017

Research Associate bijenvoeding en gezondheid

University of California San Diego

2017 – 2019

Postdoc bijenvolk voeding en gezondheid

Iowa State University, Ames, Iowa

2020 – 2022

Senior Research Associate bijen monitoring

Julius Kühn Institute, Braunschweig

sinds juli 2022

Onderzoeker honingbijen gezondheid

Wageningen University and Research







770 miljoen mensen ondervoed



2020



2014



+160 miljoen
sinds 2014





2000



2019

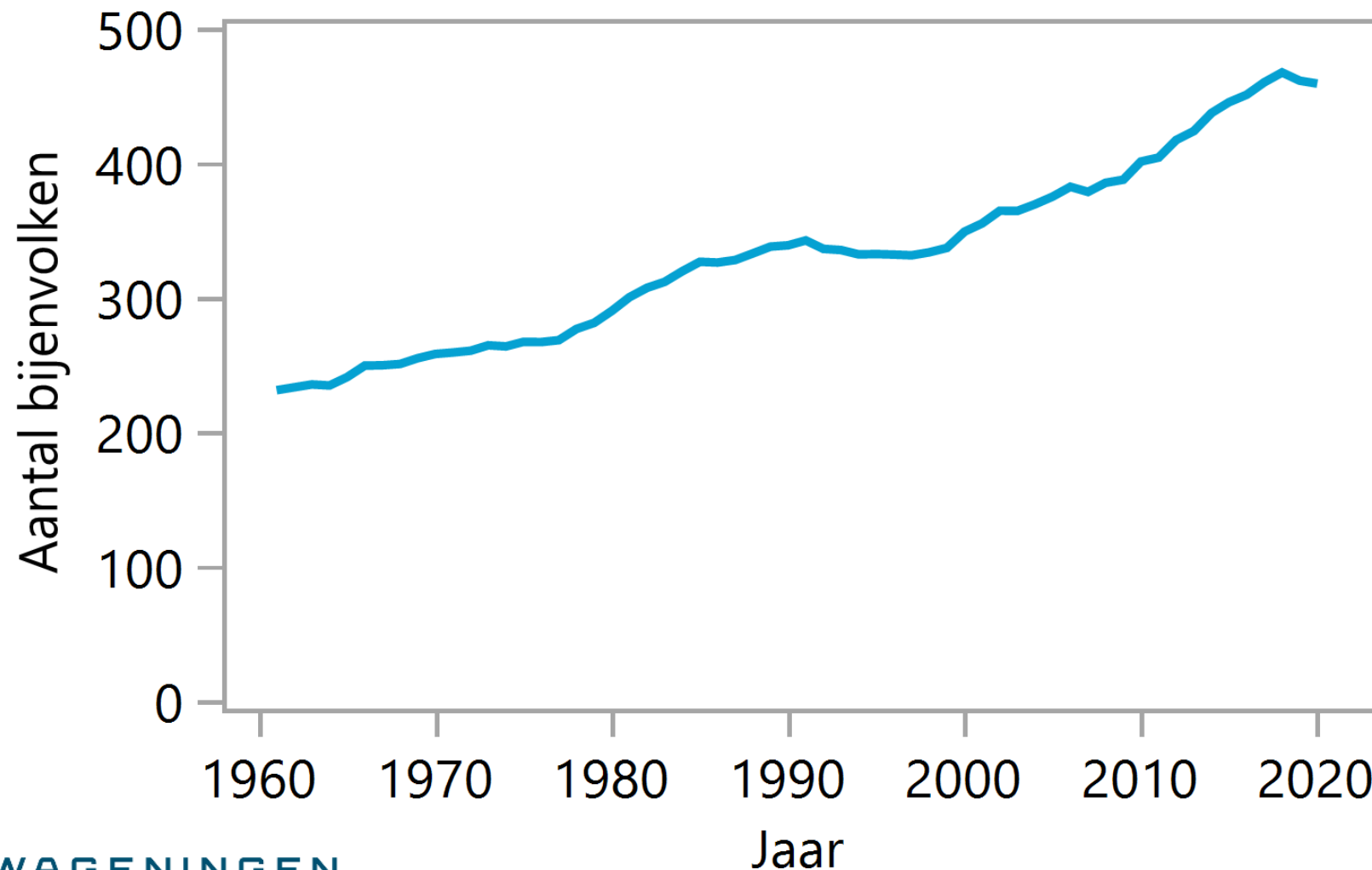
Wereldwijd:

Primaire productie
9.4 miljard ton
(+53%)



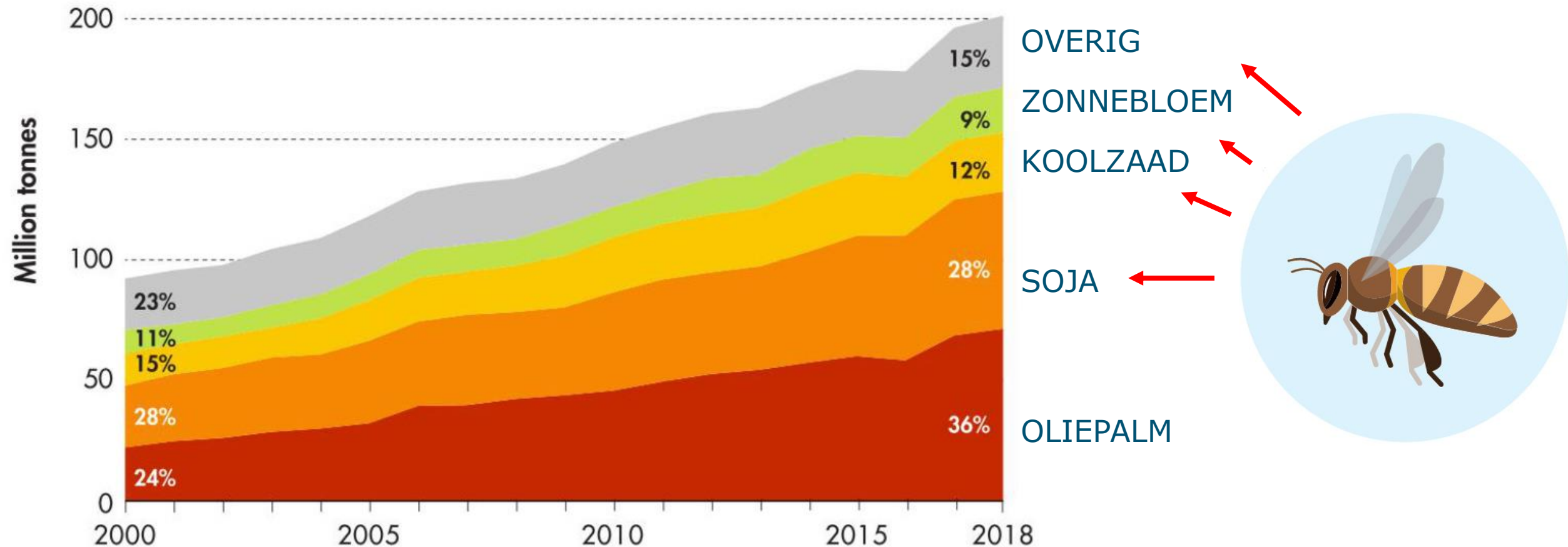


Wereldwijd: 460 miljoen bijenvolken





Productie plantaardige olien: meer dan verdubbeld (+118%)





Food and Agriculture Organization
of the United Nations



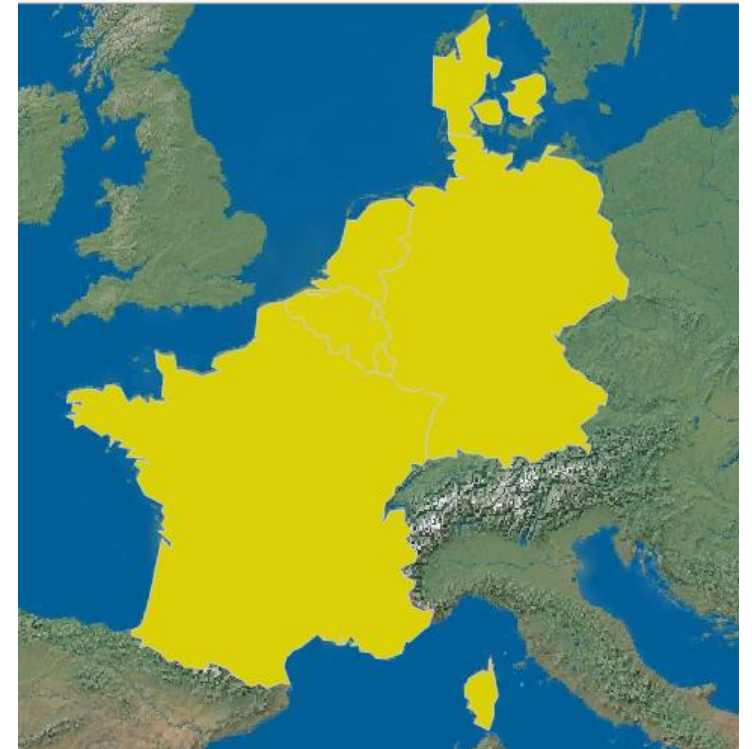
2000



2019



-127 miljoen ha

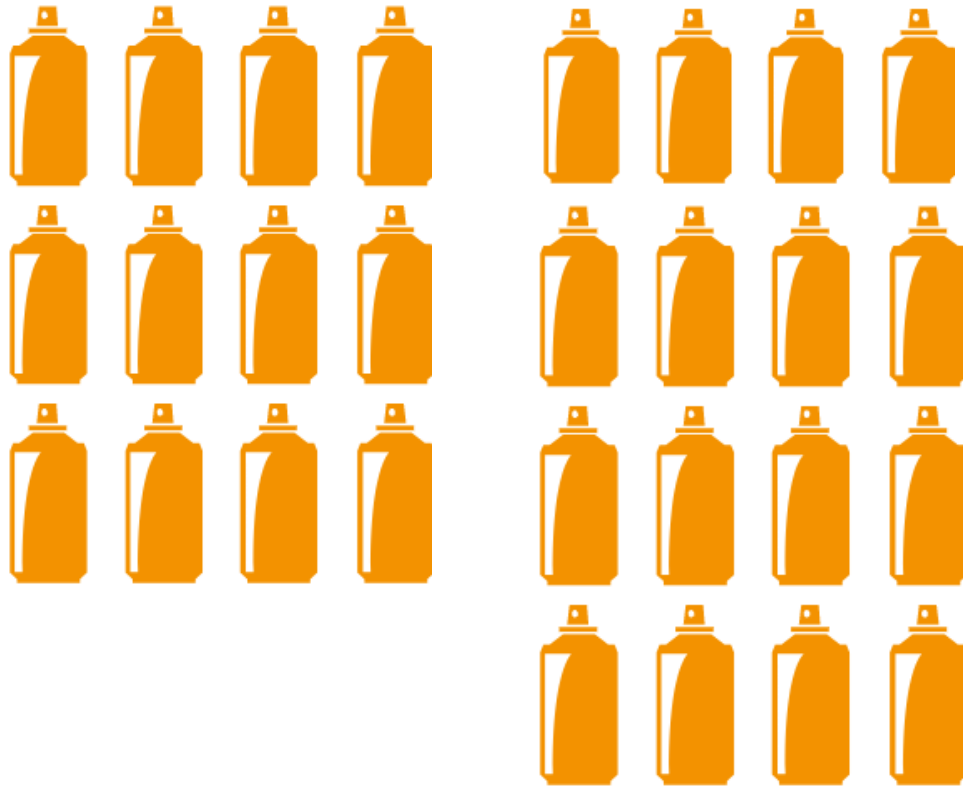


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2000

2019



+36%
pesticide

Kunstmest (totaal)
190 million ton

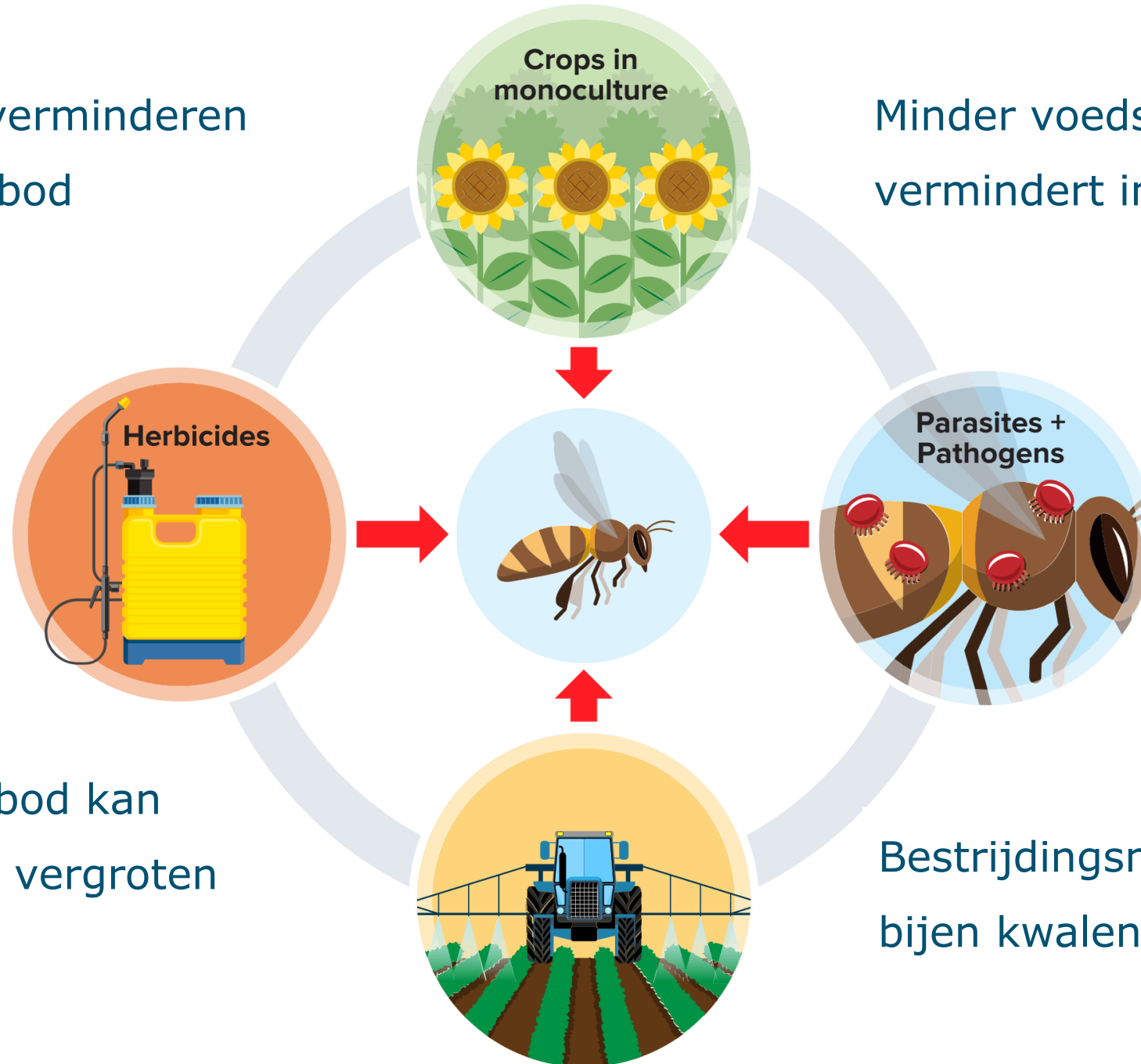


2019

(57% stikstof)

Herbiciden verminderen
voedsel aanbod

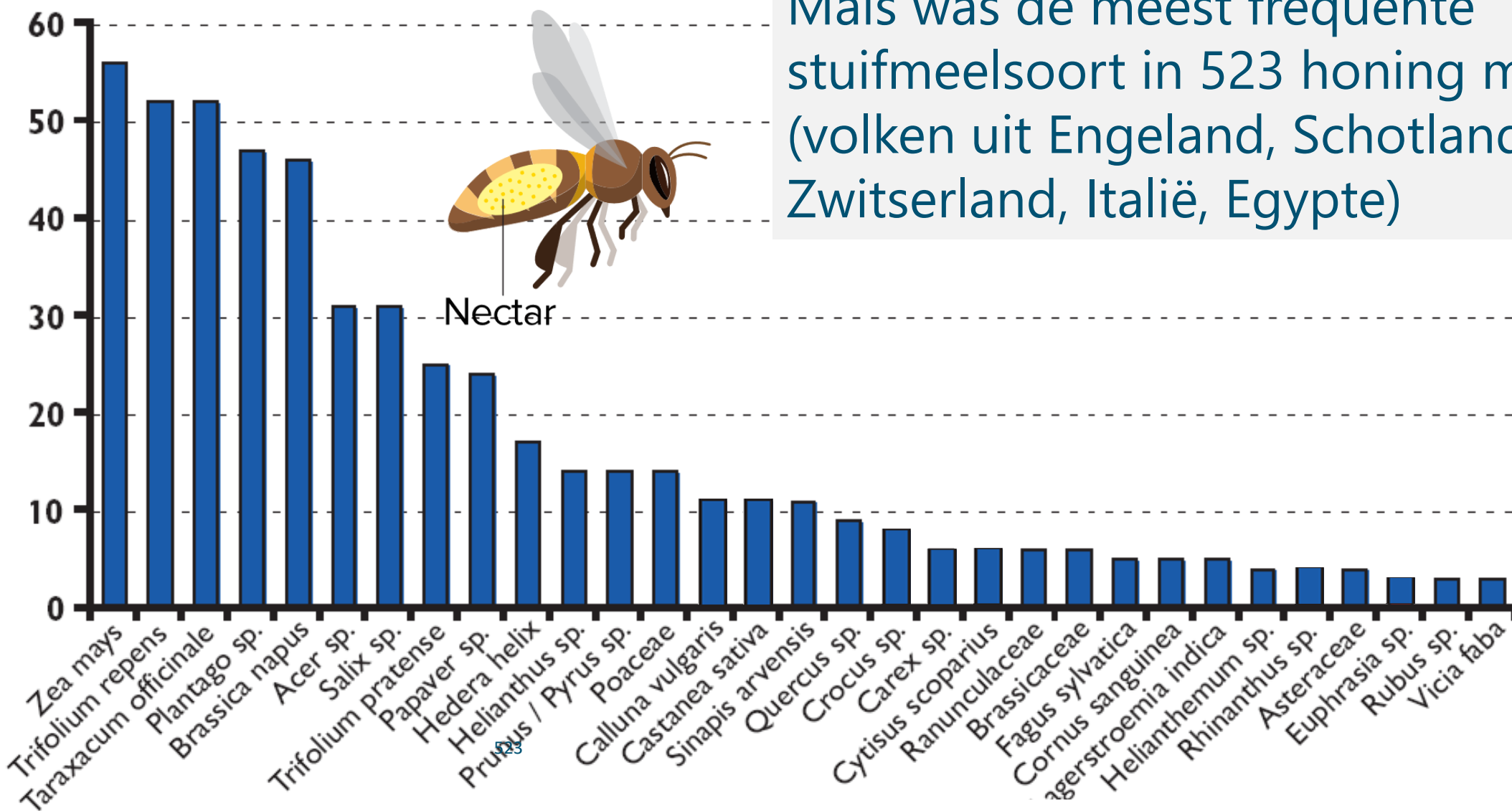
Minder voedsel aanbod
vermindert immuniteit



Minder voedsel aanbod kan
pesticiden expositie vergroten

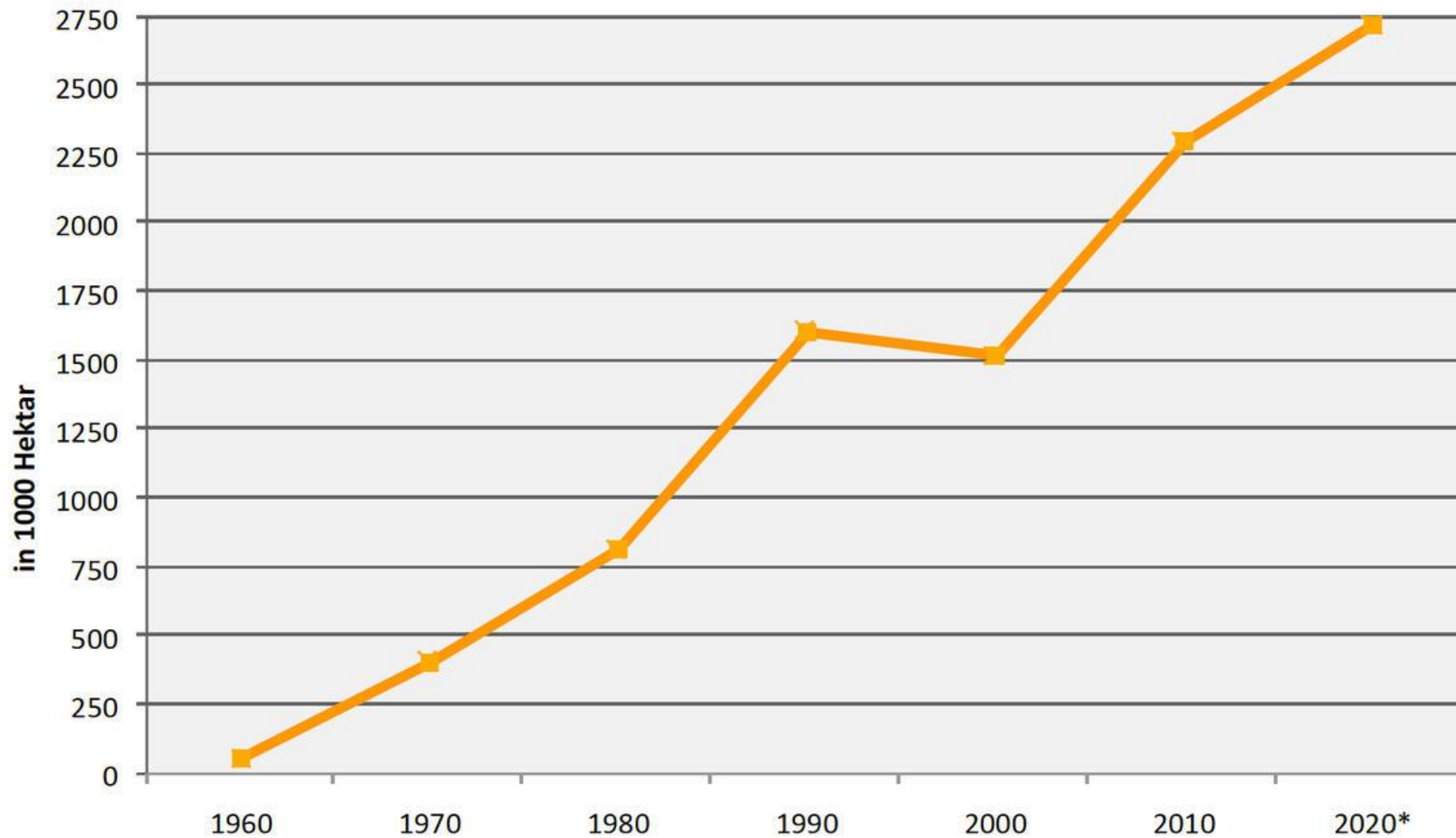
Bestrijdingsmiddelen kunnen
bijen kwalen verergenen

Aantal monsters



Mais was de meest frequente stuifmeelsoort in 523 honing monsters (volken uit Engeland, Schotland, Zwitserland, Italië, Egypte)

Stuifmeel types

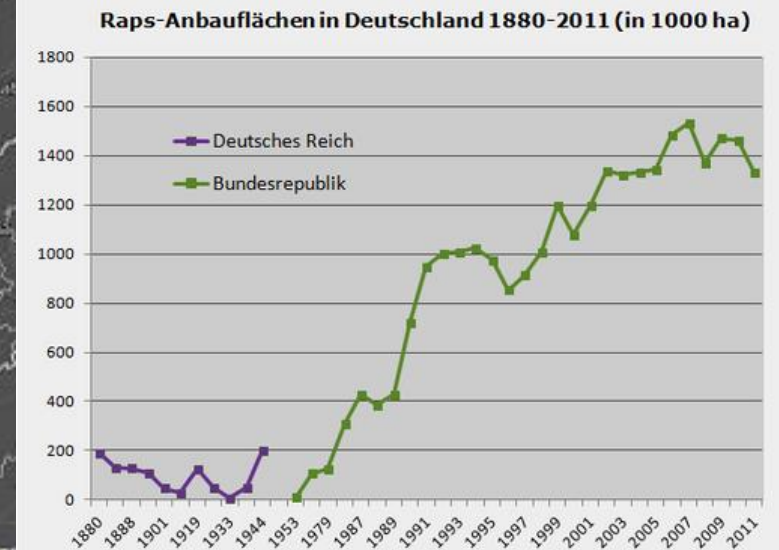


Maisanbaufläche in Deutschland 1960-2020



Nectar

6 miljoen ha koolzaad (2022)



Wat eten we vandaag





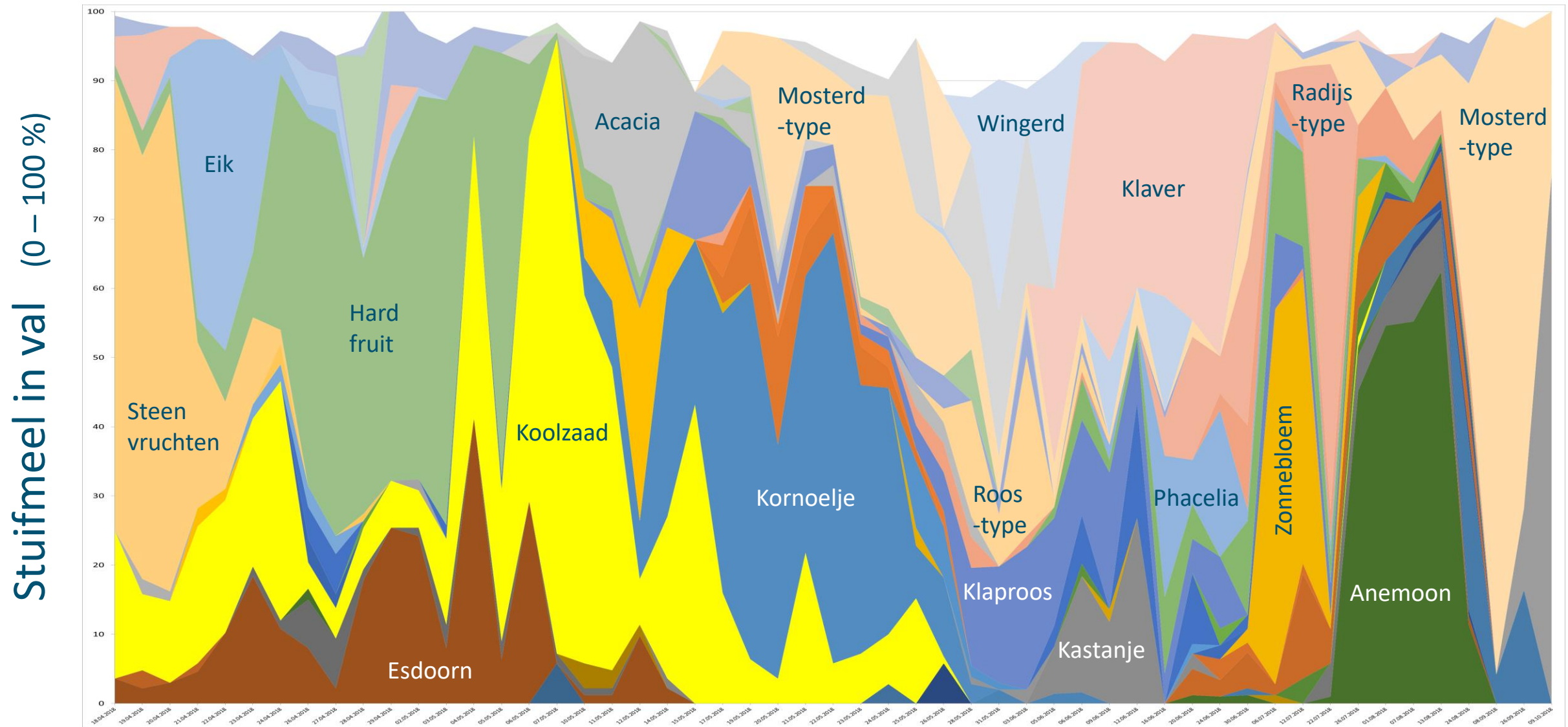


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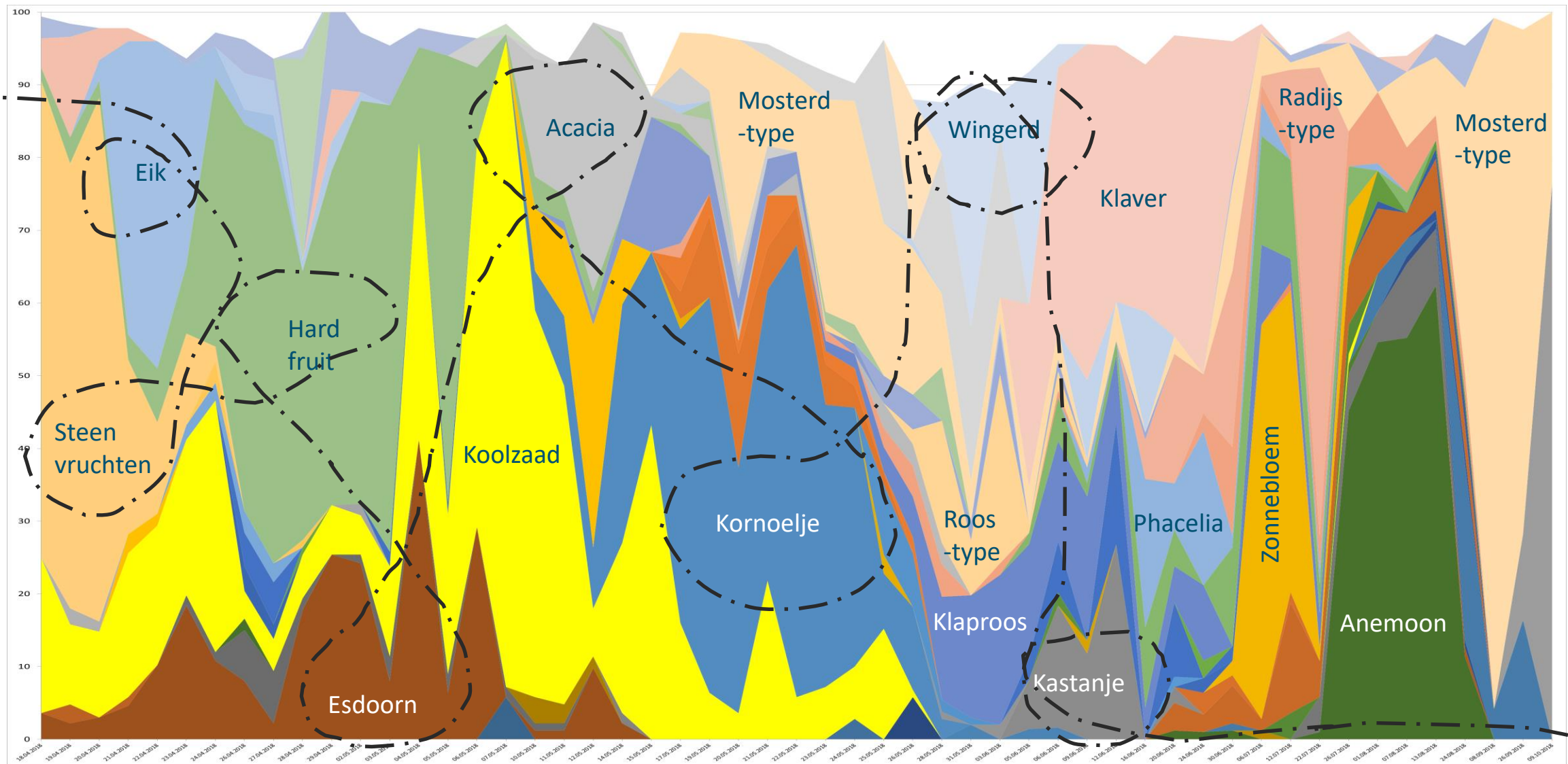
Stuifmeel in val (0 – 100 %)

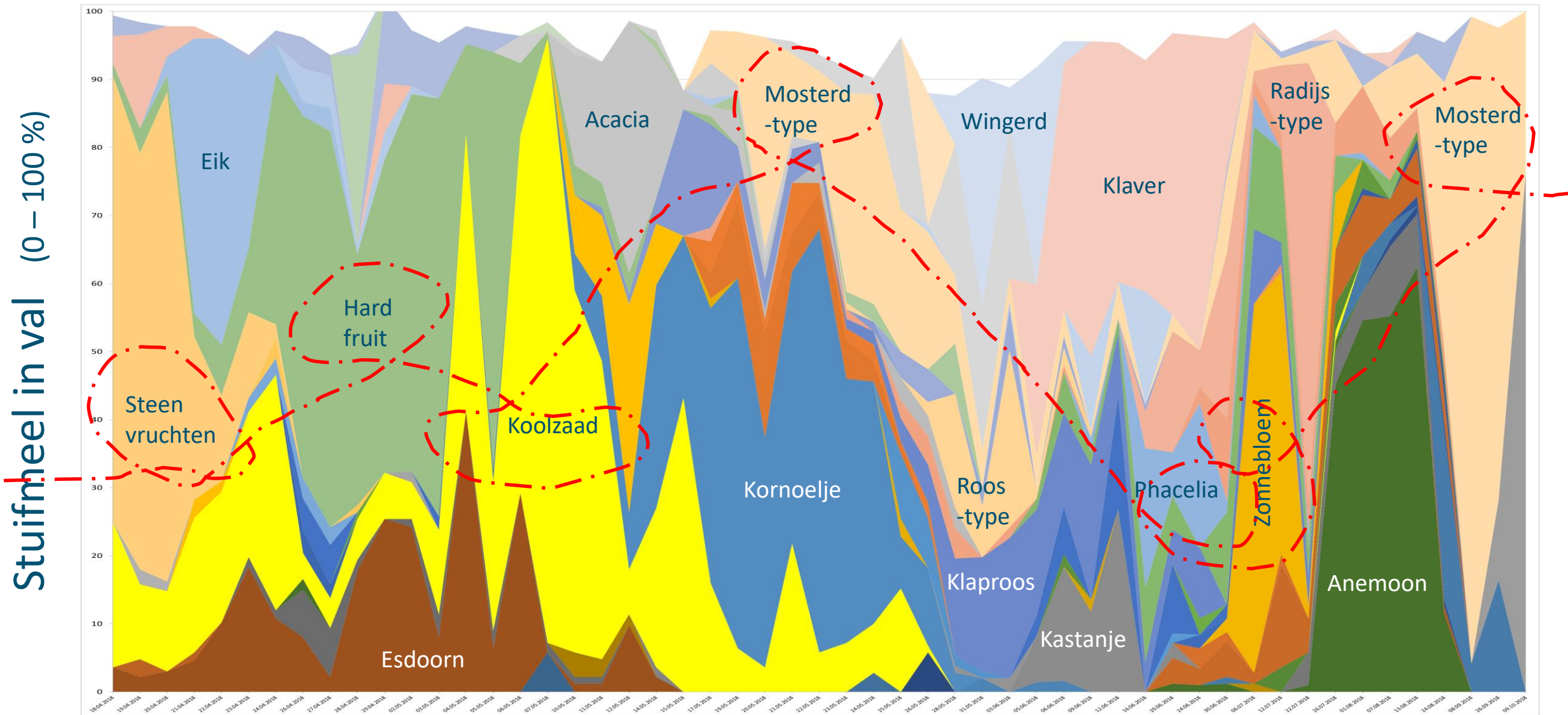


Dr. Christoph Otten
Eén locatie: Ingelheim am Rhein (2018)
N=74 stuifmeelval monsters



Stuifmeel in val (0 – 100 %)

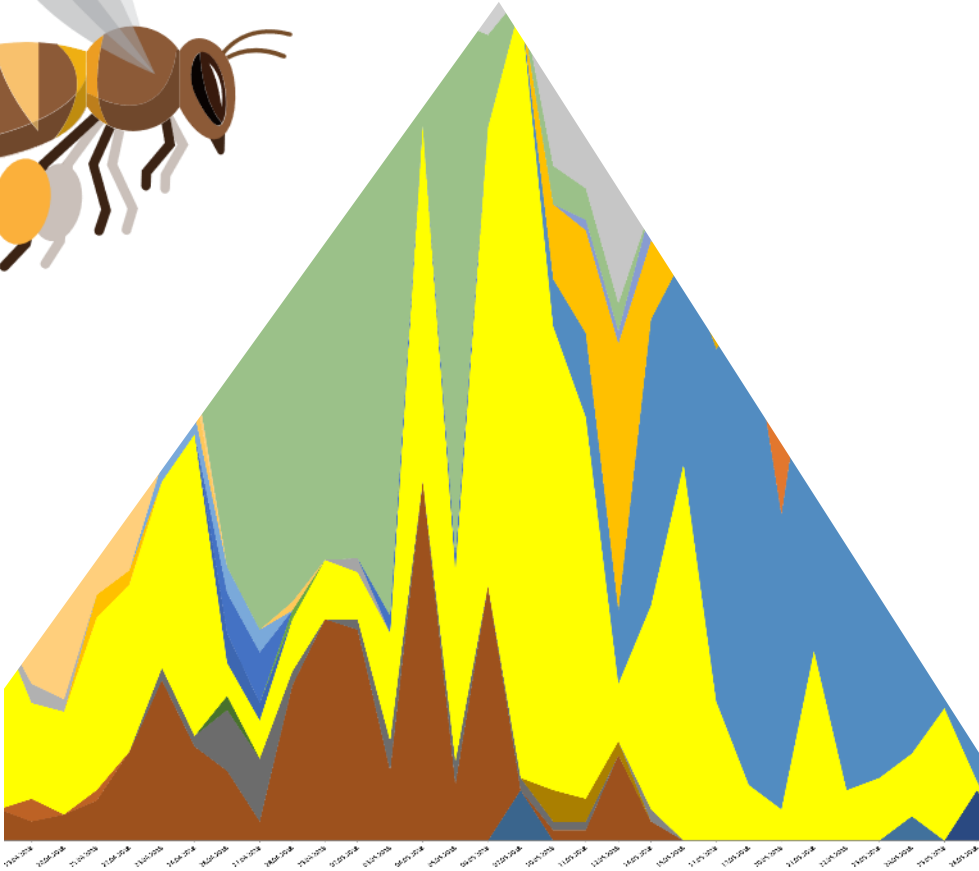




Koolzaad



Pollen



Bron: Dr. Christoph Otten, Mayen

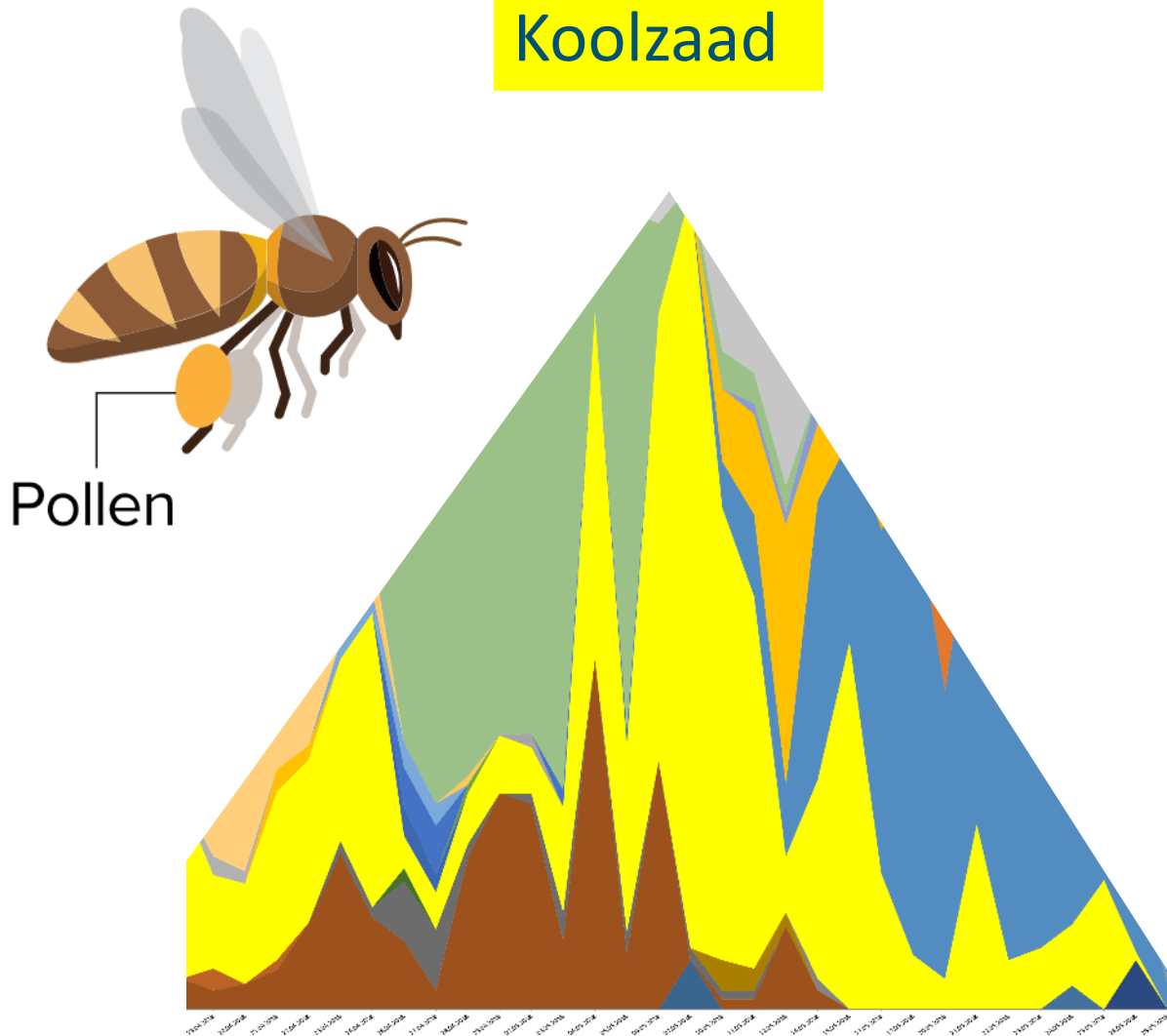
Pesticiden in stuifmeel monsters

📍 Celle
📍 FLI
📍 Hohenheim
📍 Hohen-Neuendorf
📍 Kirchhain
📍 Mayen
📍 Veitshöchheim



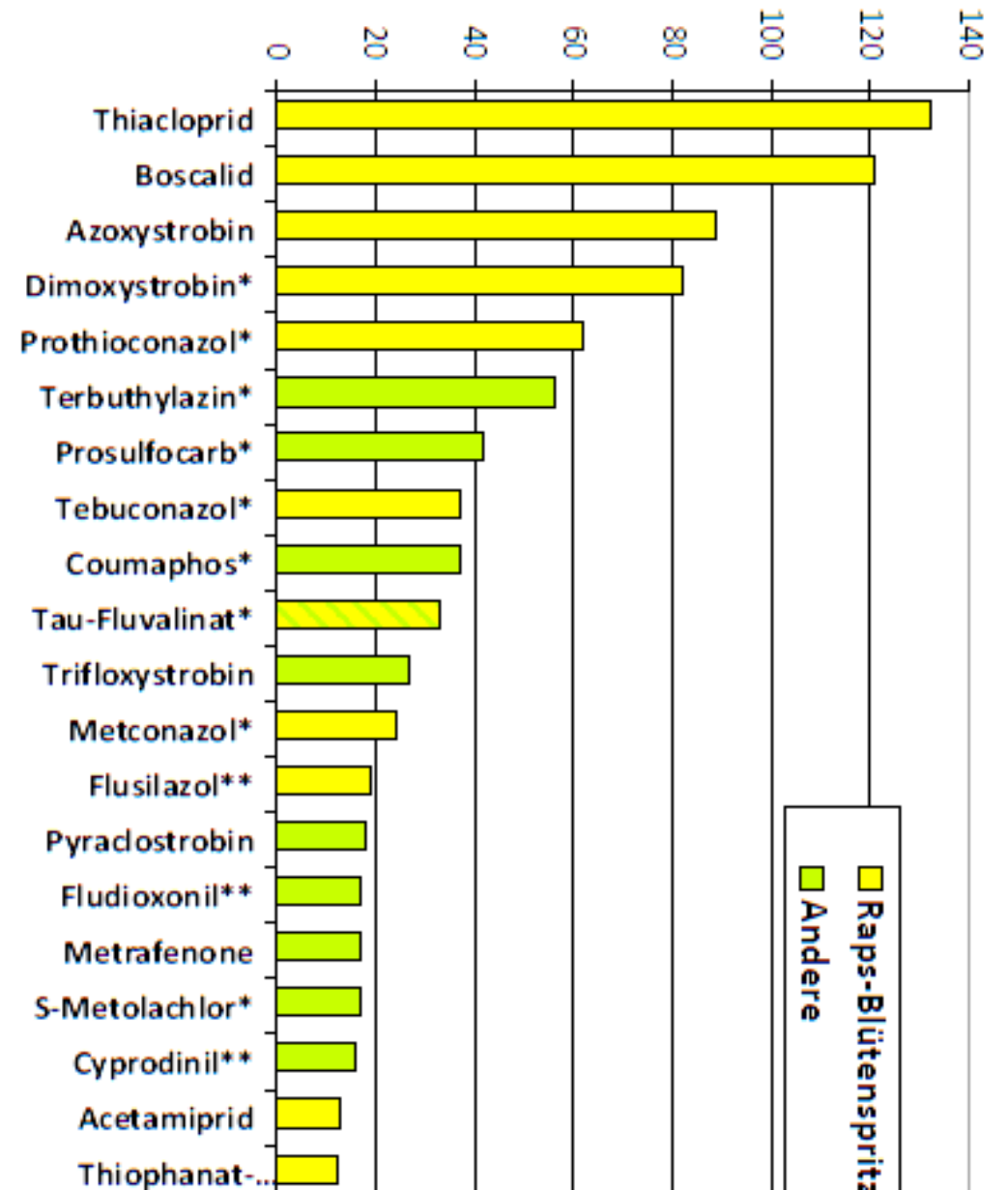
Bron: *Deutsches Bienenmonitoring*

Koolzaad



Bron: Dr. Christoph Otten, Mayen

Pesticiden in stuifmeel monsters



Bron: *Deutsches Bienenmonitoring*



Wat eten we vandaag





Dorit Avni et al (2009) Israel Journal of Plant Sciences
Dorit Avni et al (2014) Journal of Insect Physiology

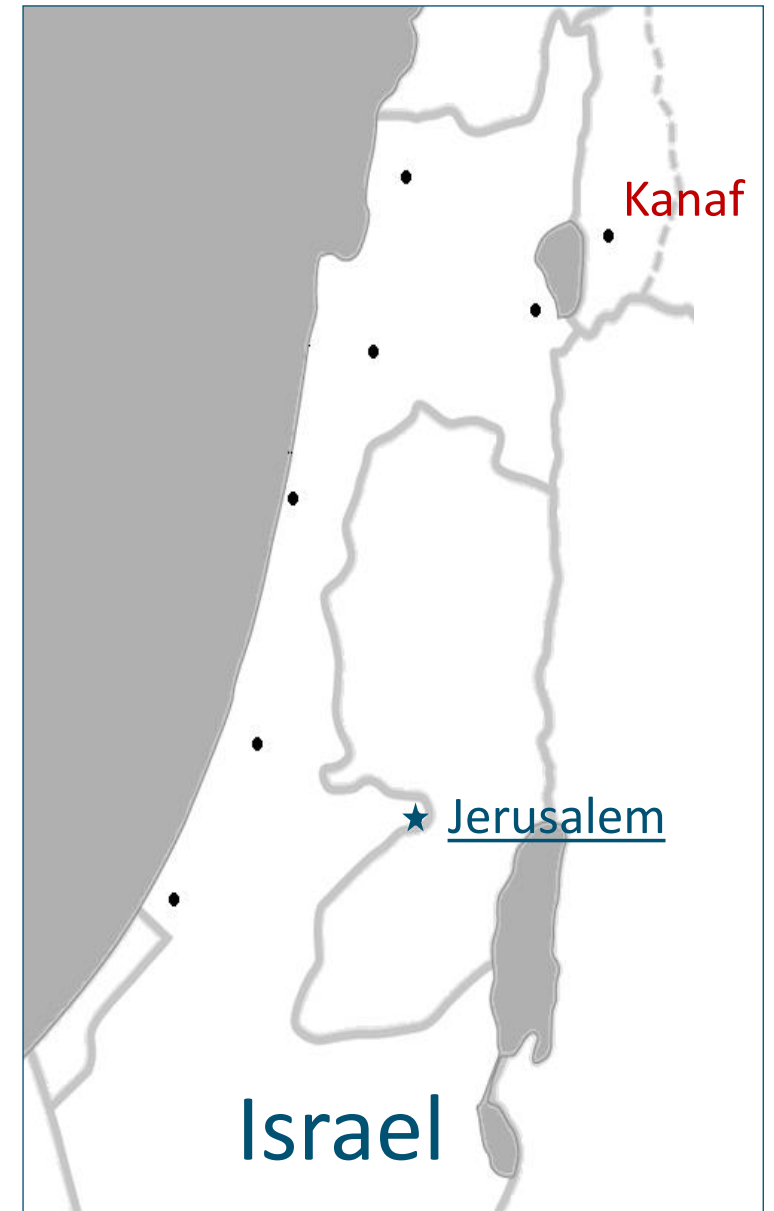
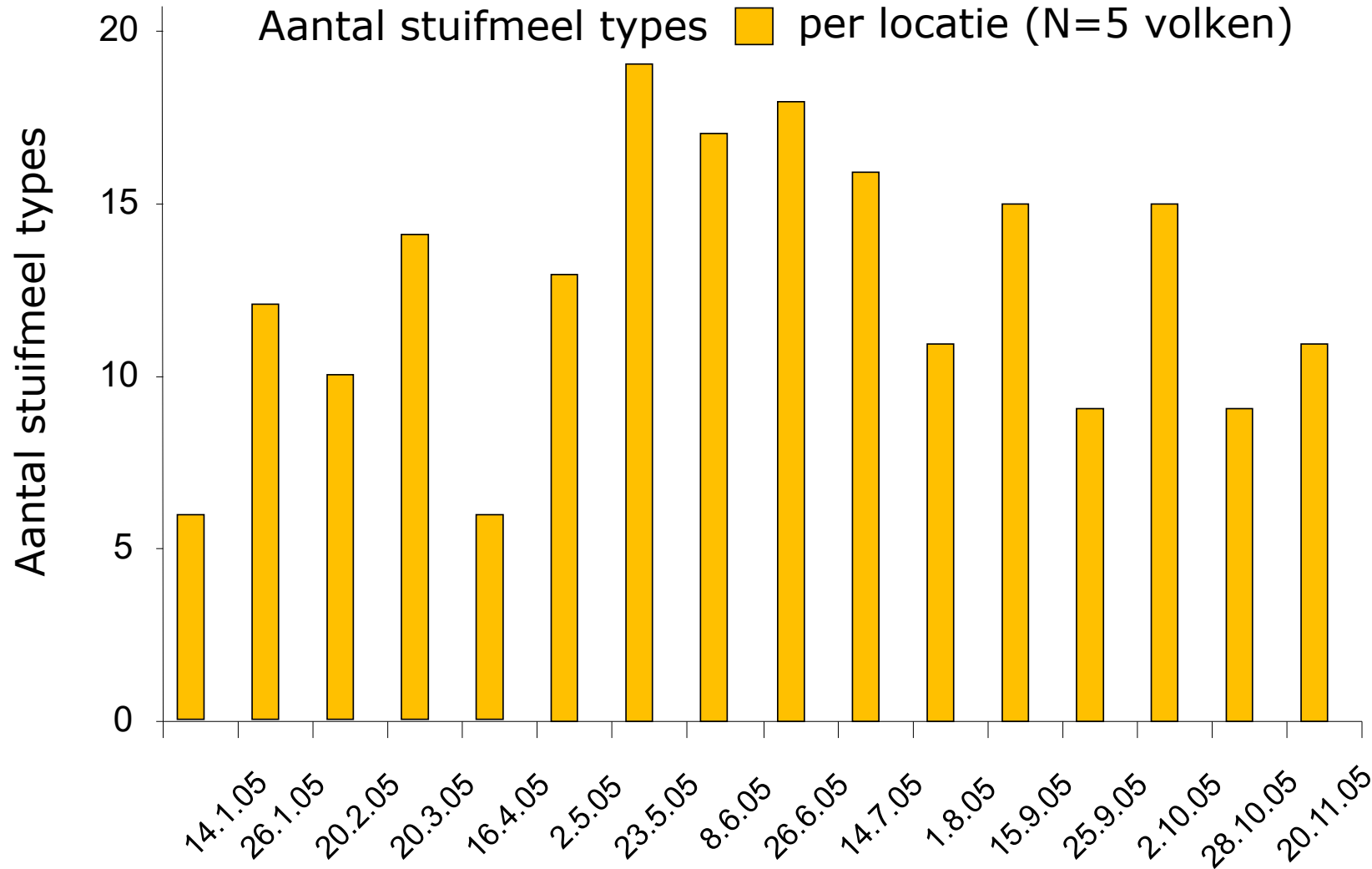


7 locaties
5 pollenvallen per locatie



285 volk monsters - 28500 stuifmeelklompjes

Kanaf



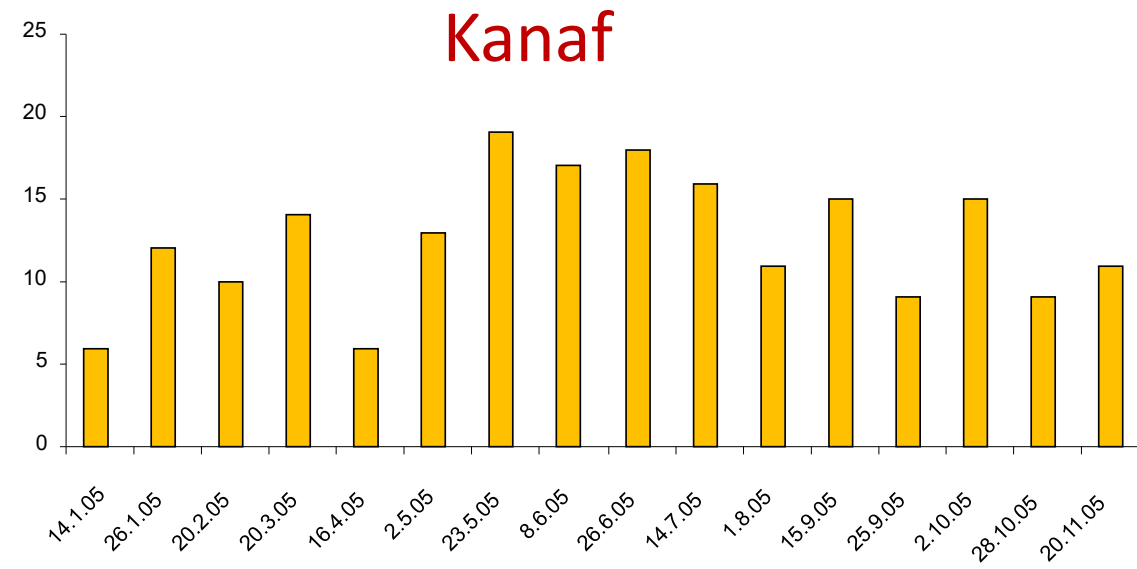
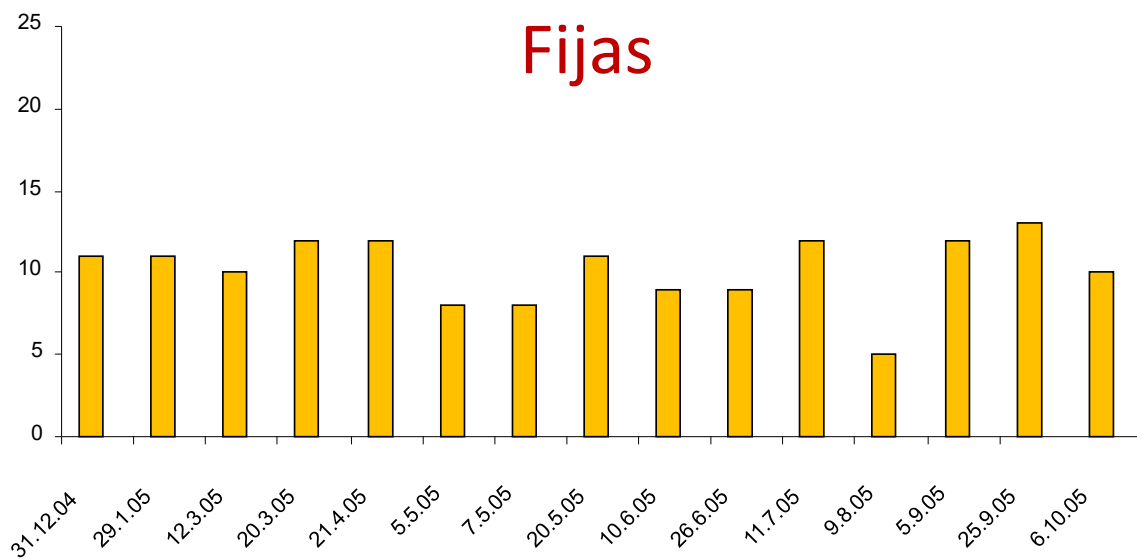
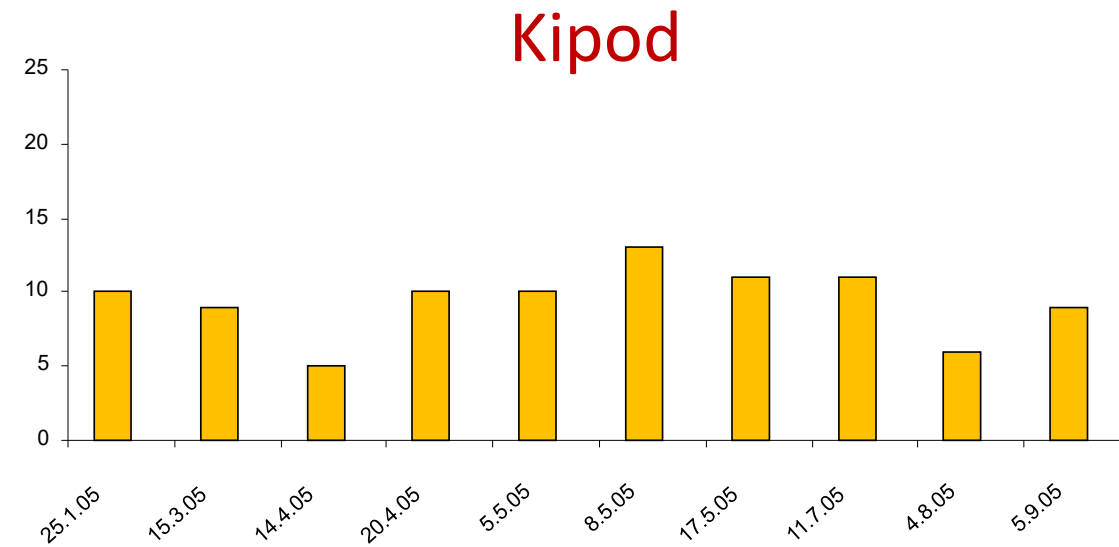
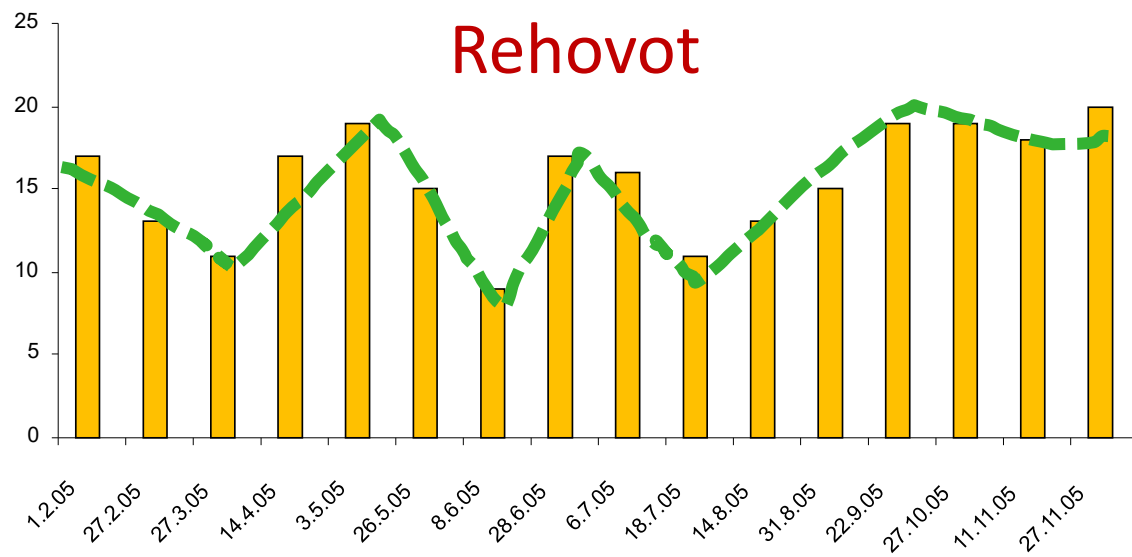
Kanaf

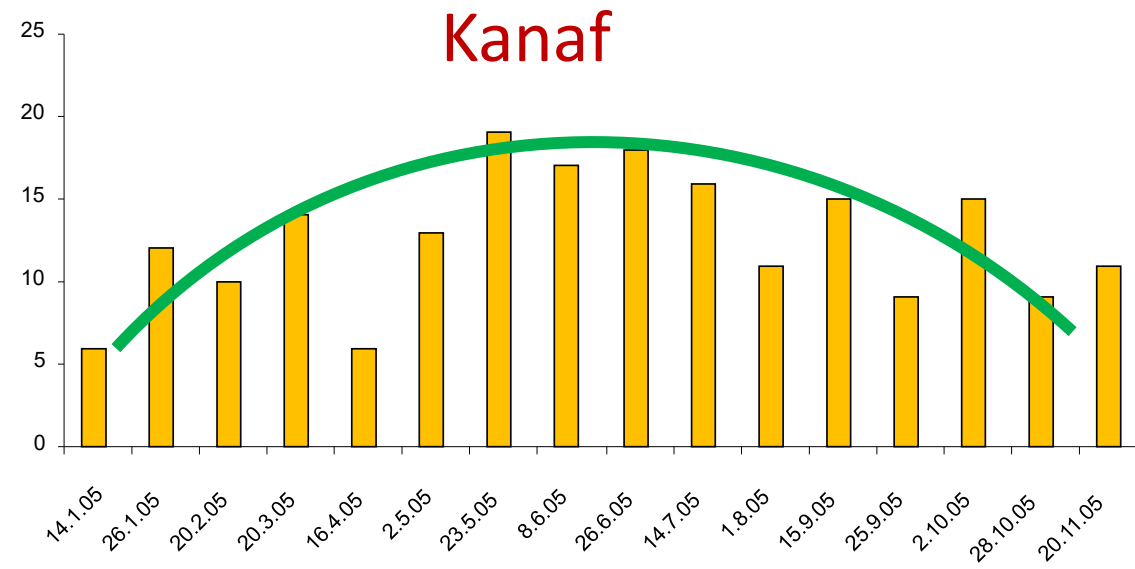
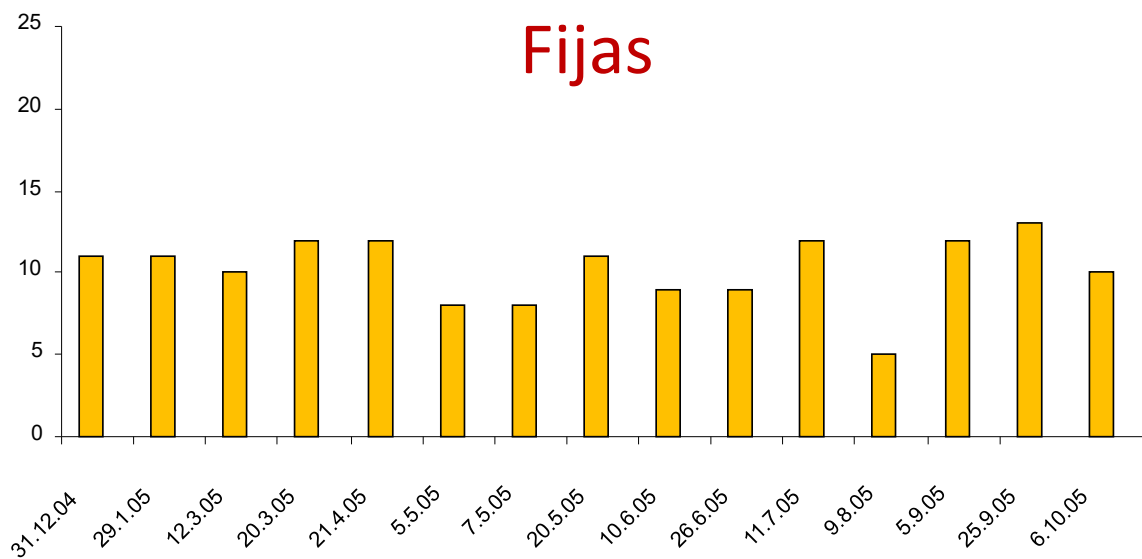
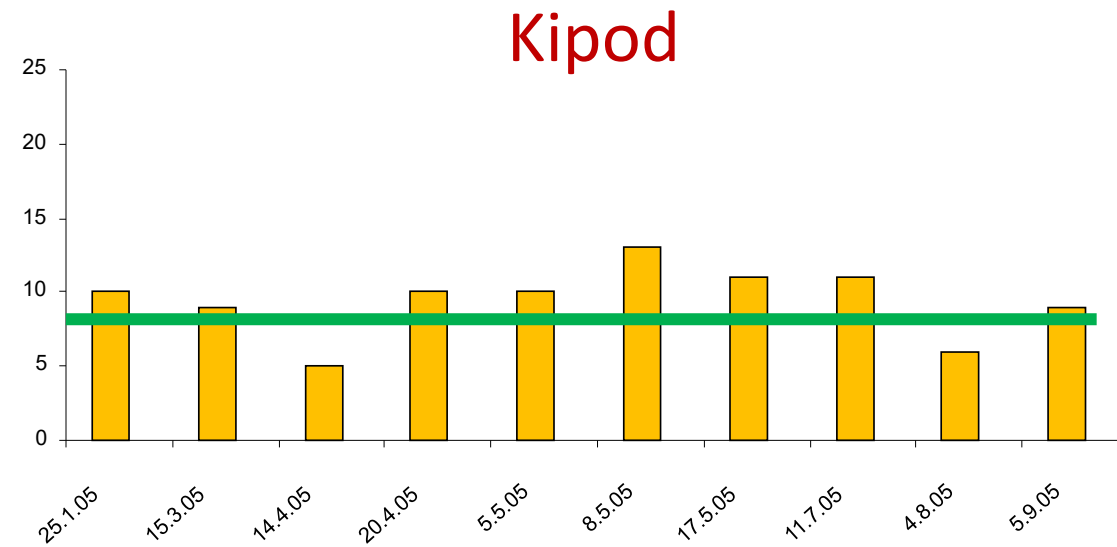
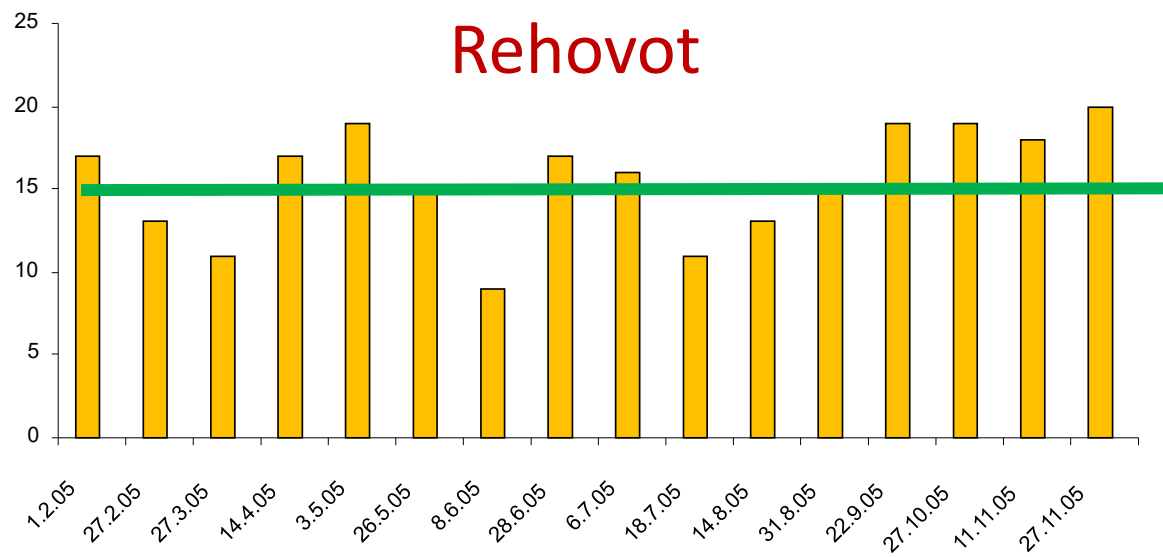


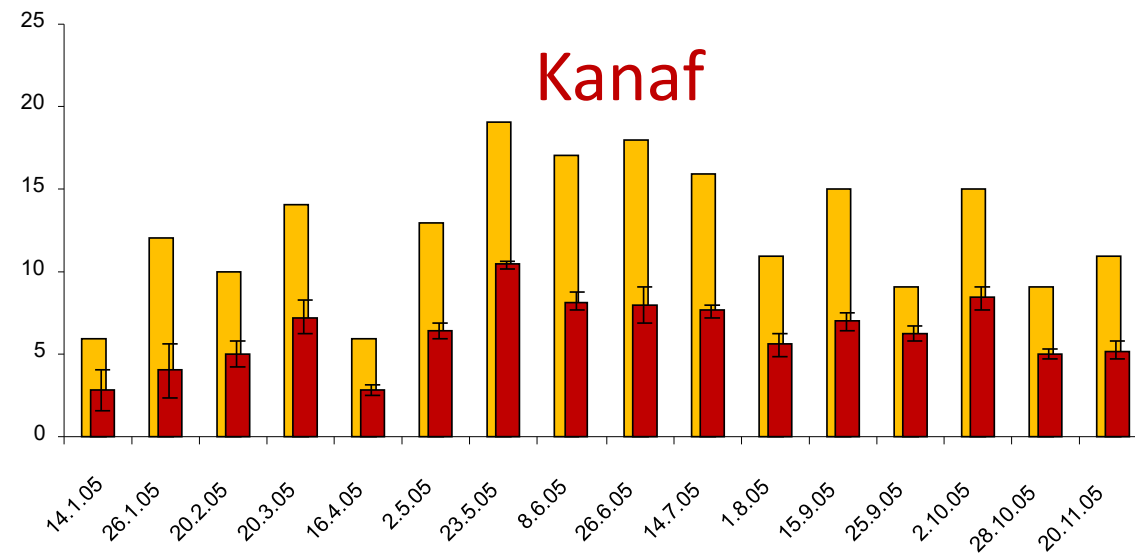
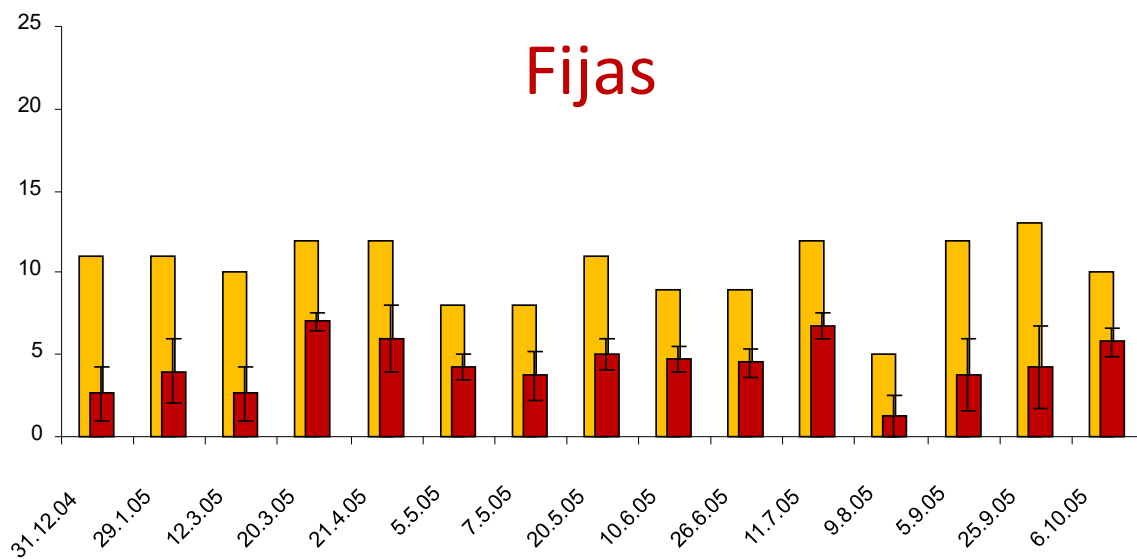
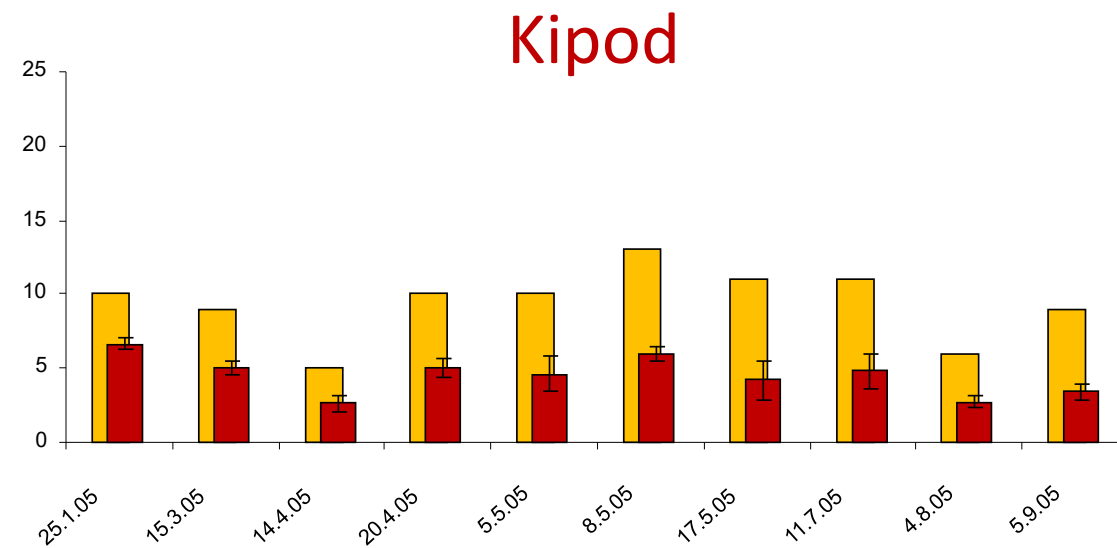
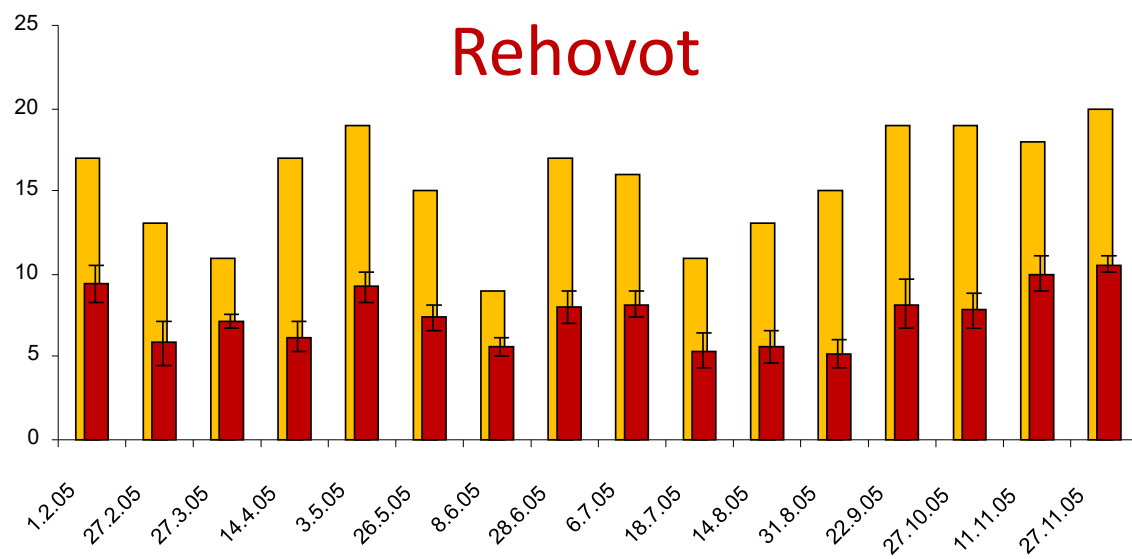
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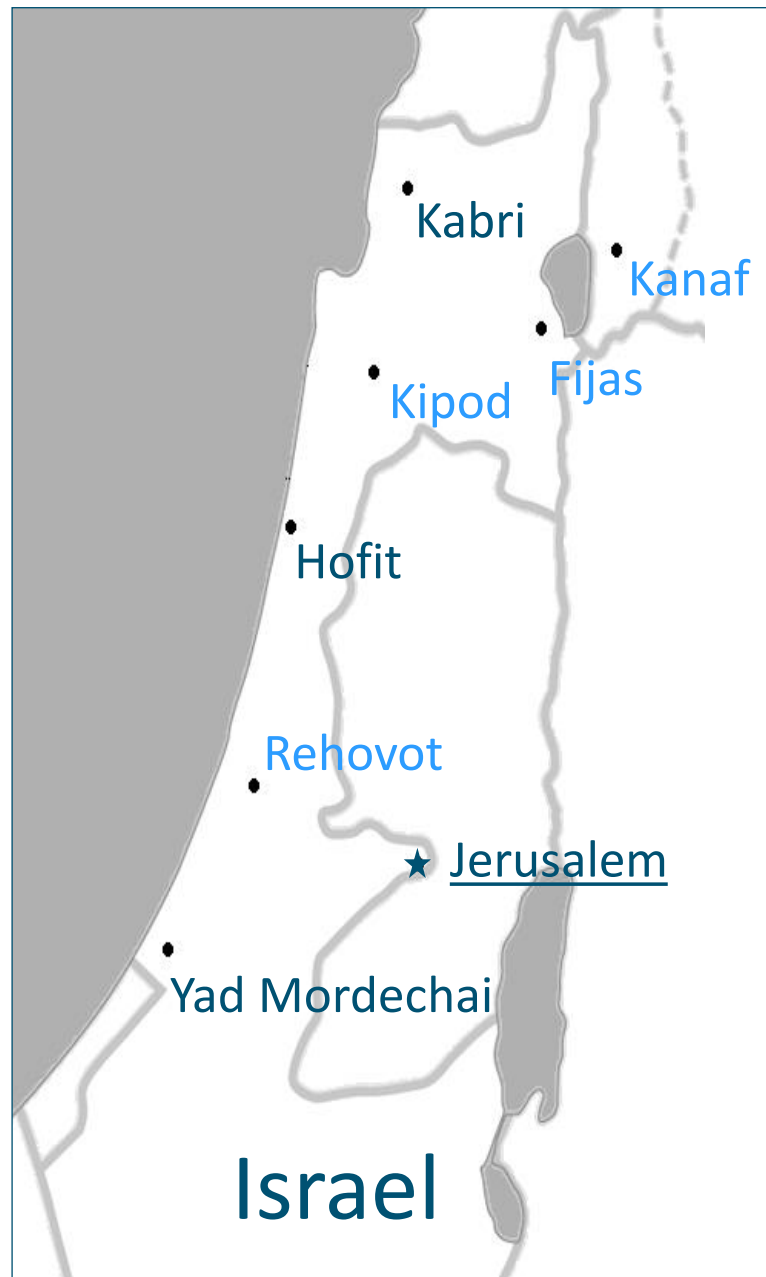
Dorit Avni et al (2009) Israel Journal of Plant Sciences
Dorit Avni et al (2014) Journal of Insect Physiology



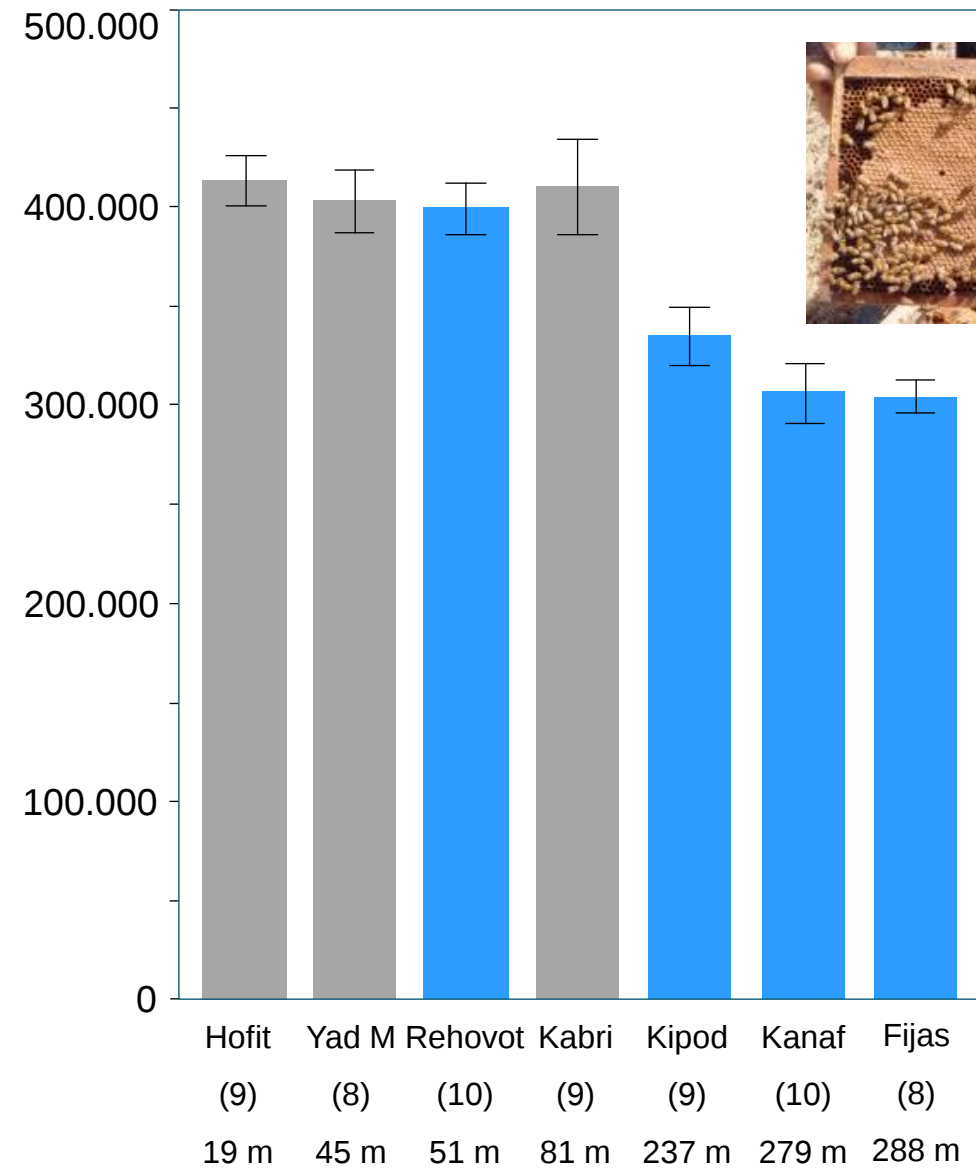




Bron: Dorit Avni et al (2014) Journal of Insect Physiology



Gesloten broedcellen (werksters) per jaar



Locatie (N volken)
Hoogte boven zeeniveau



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CSI pollen: Diversity of honey bee collected pollen studied by citizen scientists.
Brodschneider R, ... , Jozef J.M. van der Steen (2021) Insects 12, 987.

55 Imkers uit heel Nederland analyseerden in 2014 en 2015
de diversiteit van stuifmeelklompjes van hun bijenvolken



consistent
stedelijk
minder stuifmeel

~
~
~

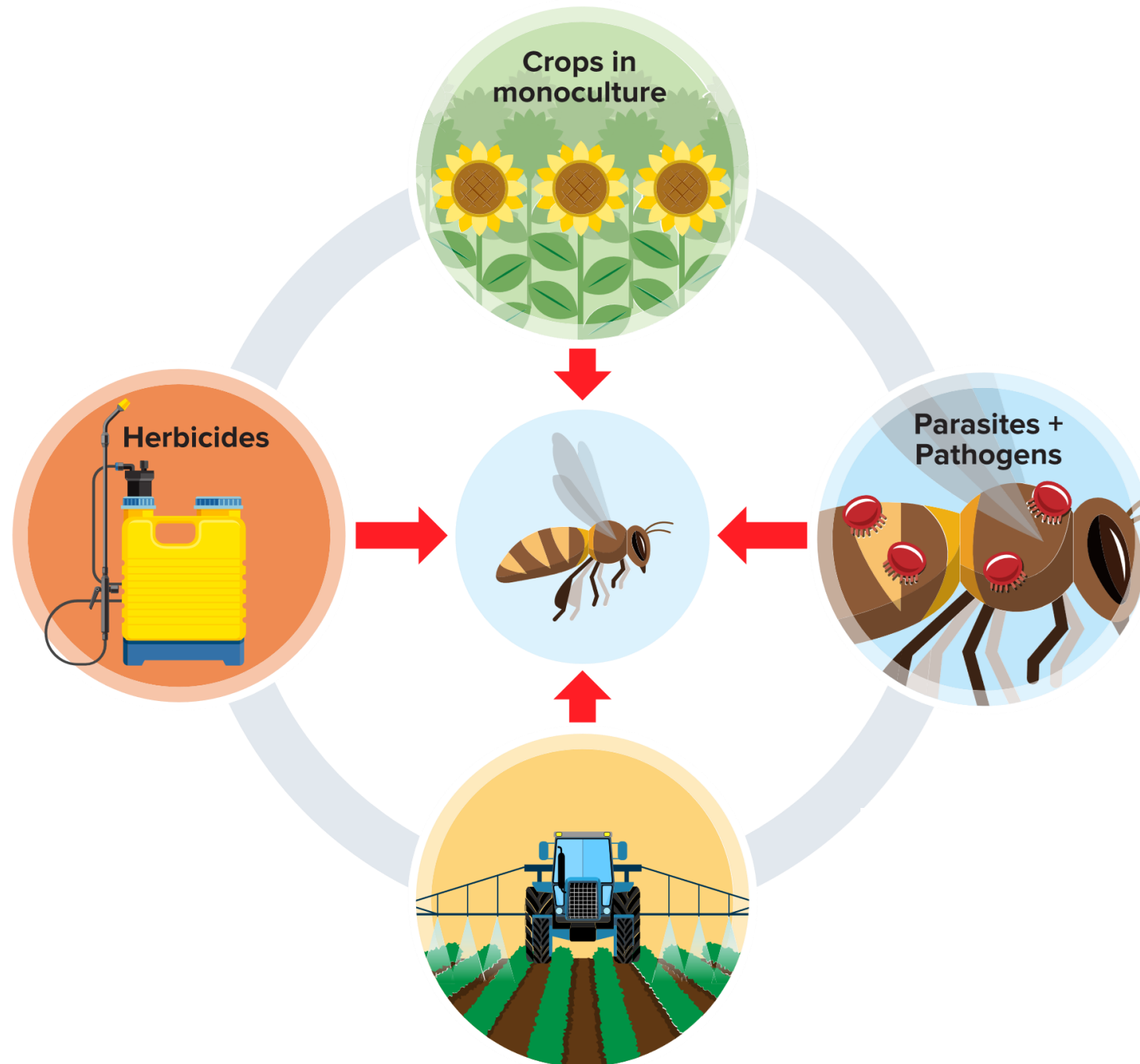
6 kleur types per monster
hogere diversiteit
hogere diversiteit

Hoge stuifmeel diversiteit

kán een goede indicator zijn voor
rijkdom aan stuifmeelbronnen

Hoge stuifmeel diversiteit

kán een goede indicator zijn voor **schaarste** aan
stuifmeelbronnen, als er weinig binnenkomt



Impact van Iowa landschap op honingbijen gezondheid

Hendriksma HP, Pritchard ZA, St Clair AL, Stein DS,
Dolezal AG, O'Neal ME, Cass RP, Hodgson EW, Toth AL



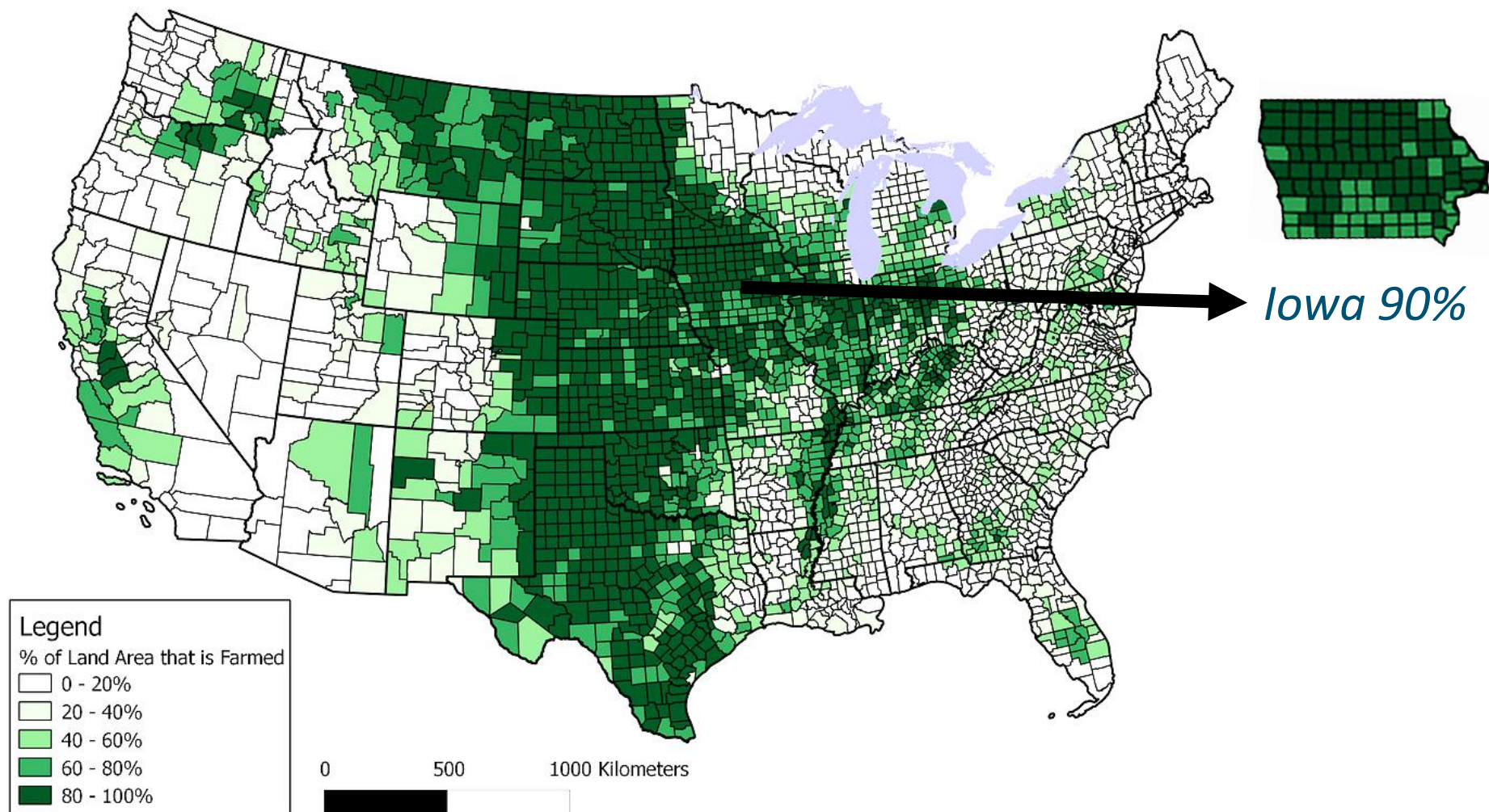


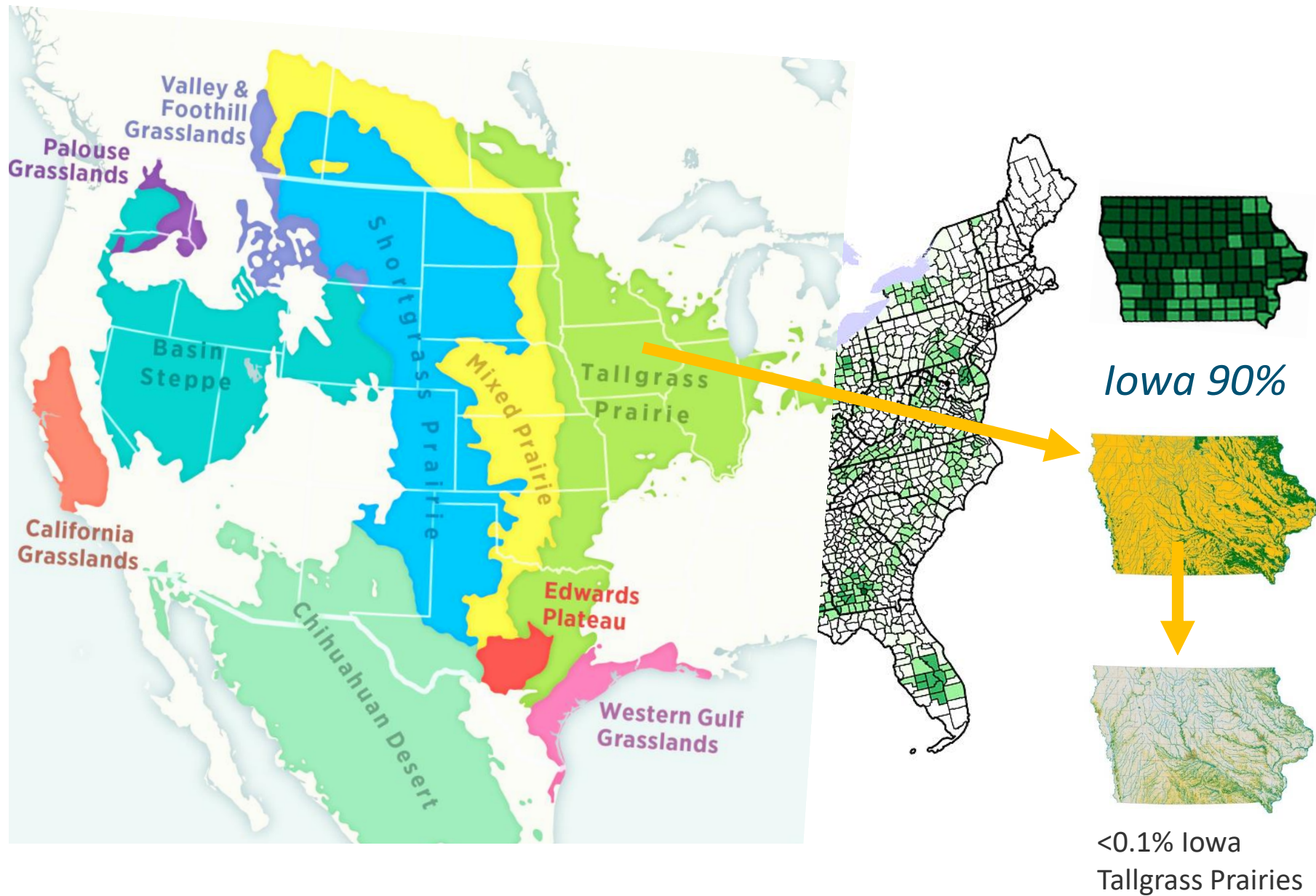
IOWA STATE UNIVERSITY

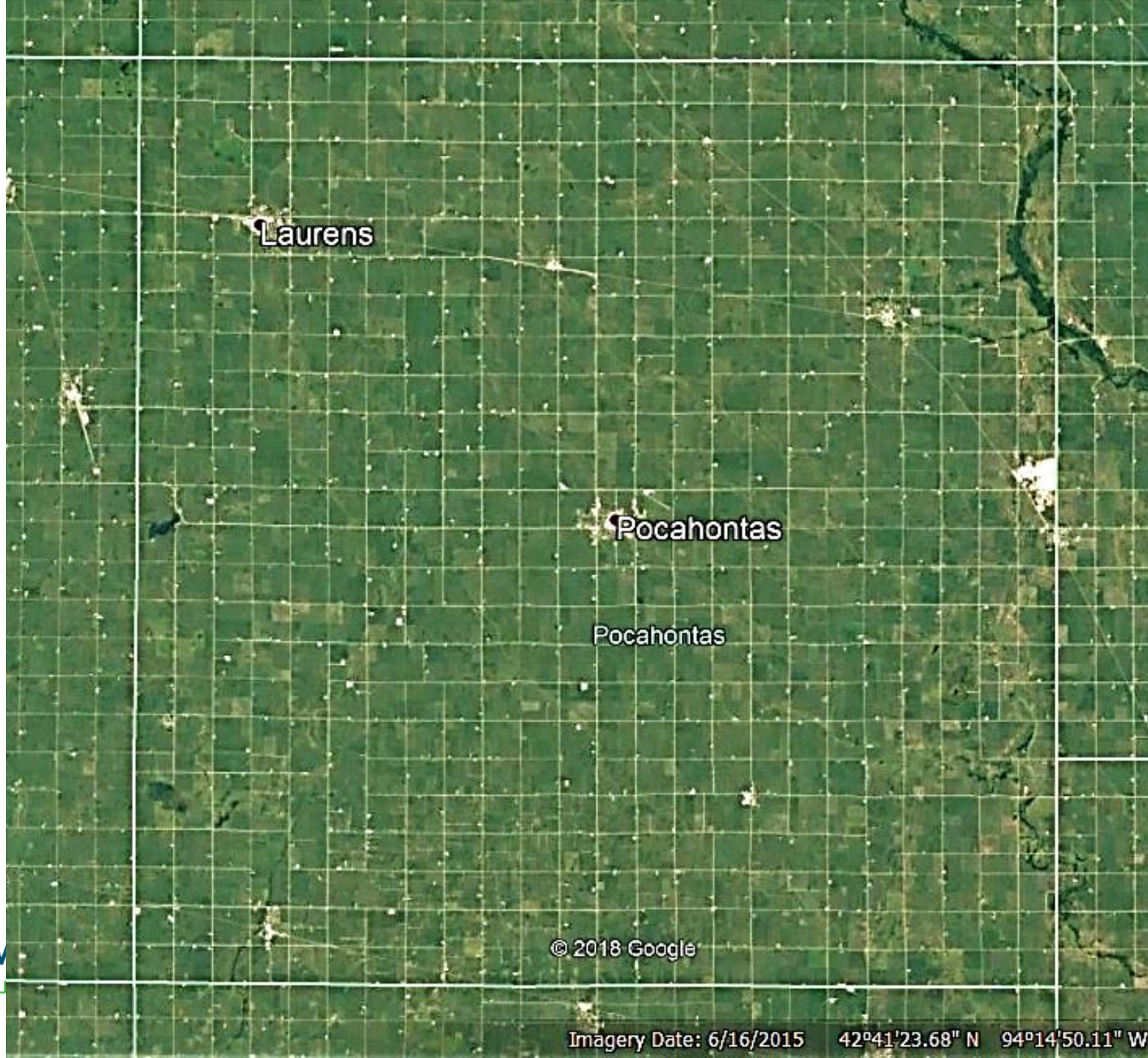
Department of Ecology, Evolution,
and Organismal Biology (EEOB)



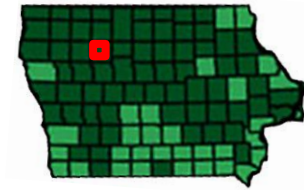
United States Department of Agriculture
National Institute of Food and Agriculture







Iowa:



145.000 km²

85000
boeren

1.7 boeren
/ km²

Nederland:



41.000 km²

52000
boeren

0.8 boeren
/ km²

Imagery Date: 6/16/2015 42°41'23.68" N 94°14'50.11" W



Google



Soja 40.000 km²

Mais 53.000 km²

Bron: *extension.iastate.edu*

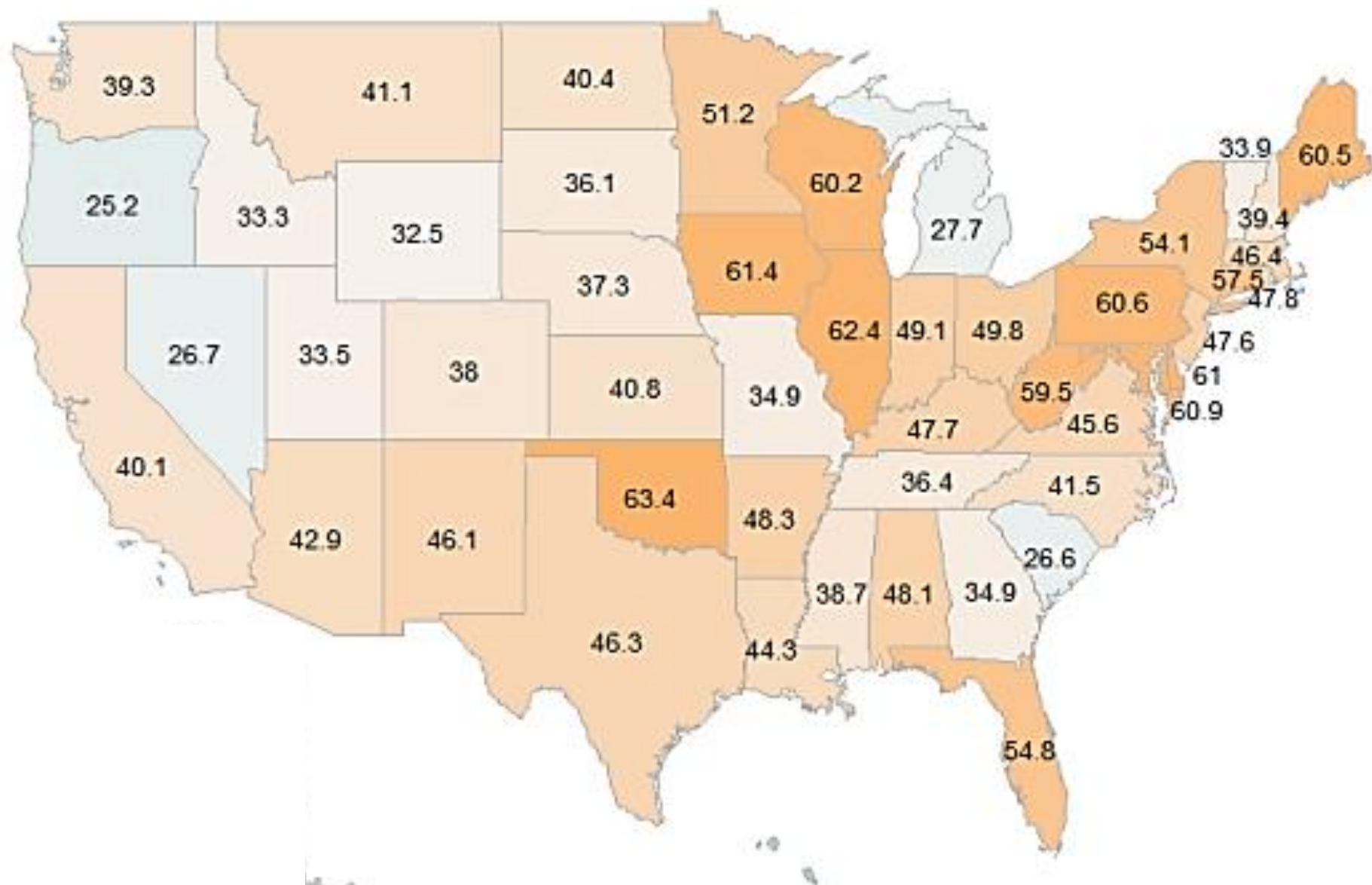










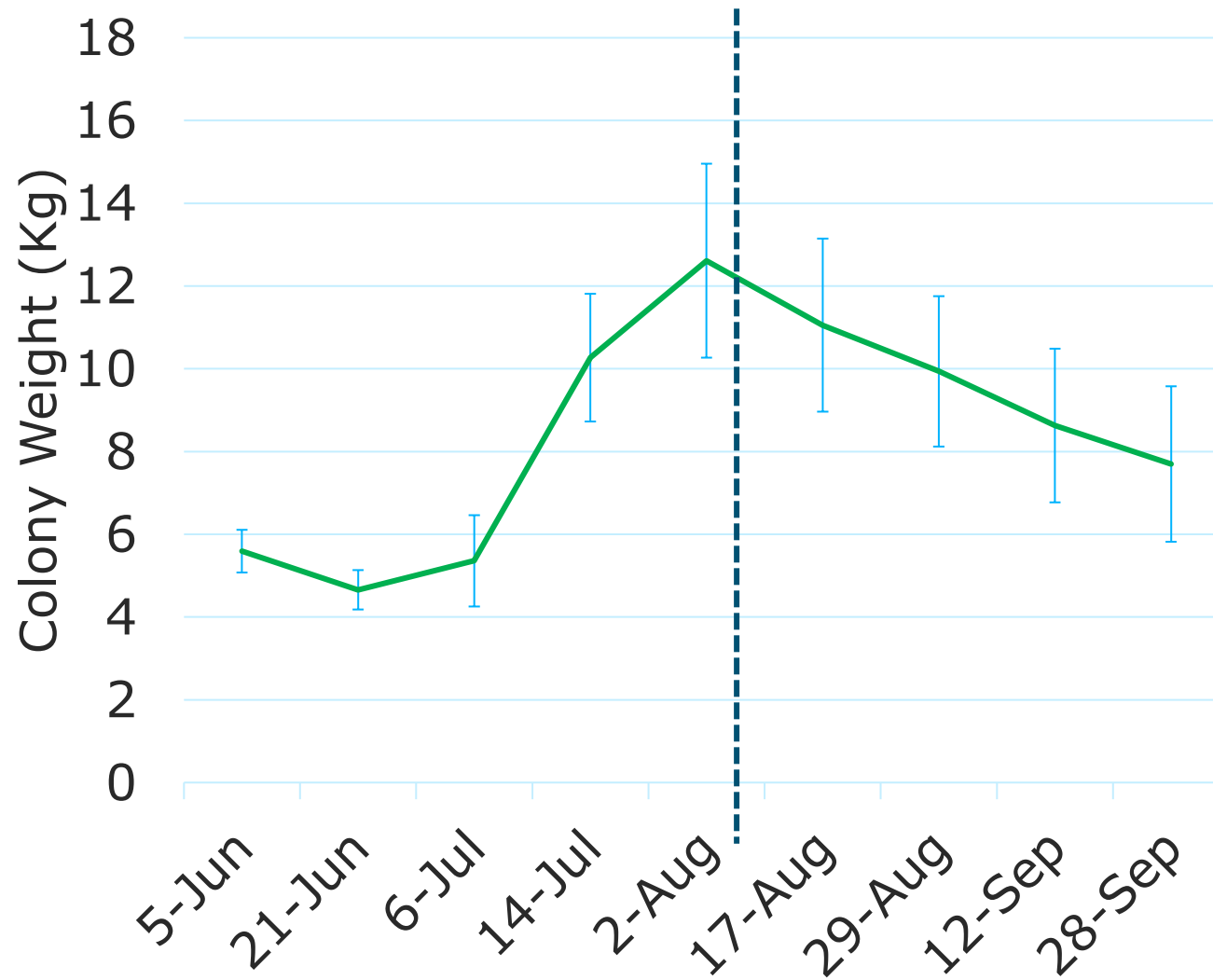




Data 2017



2017



N=24

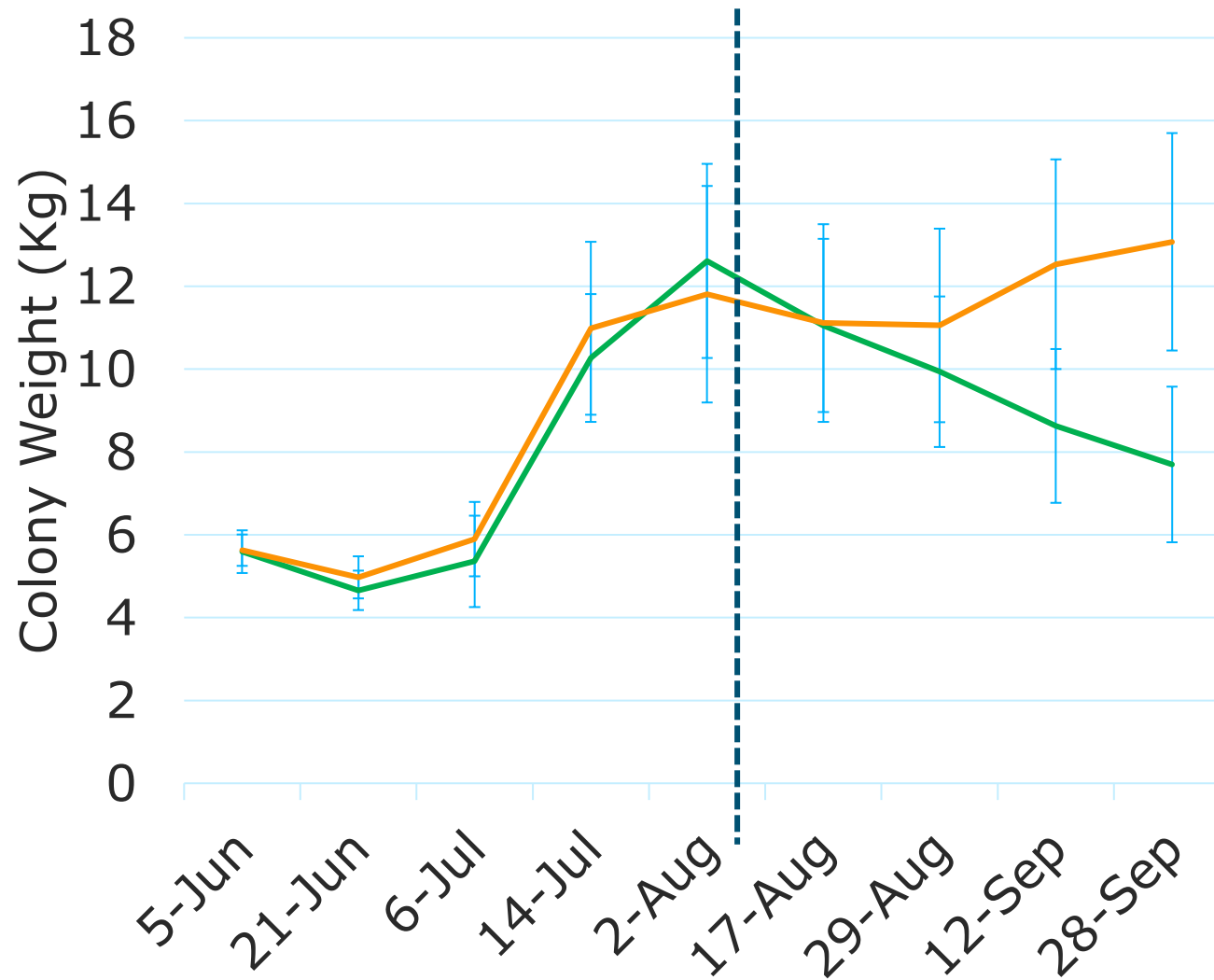


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Average Soy

Average Prairie

2017



N=24

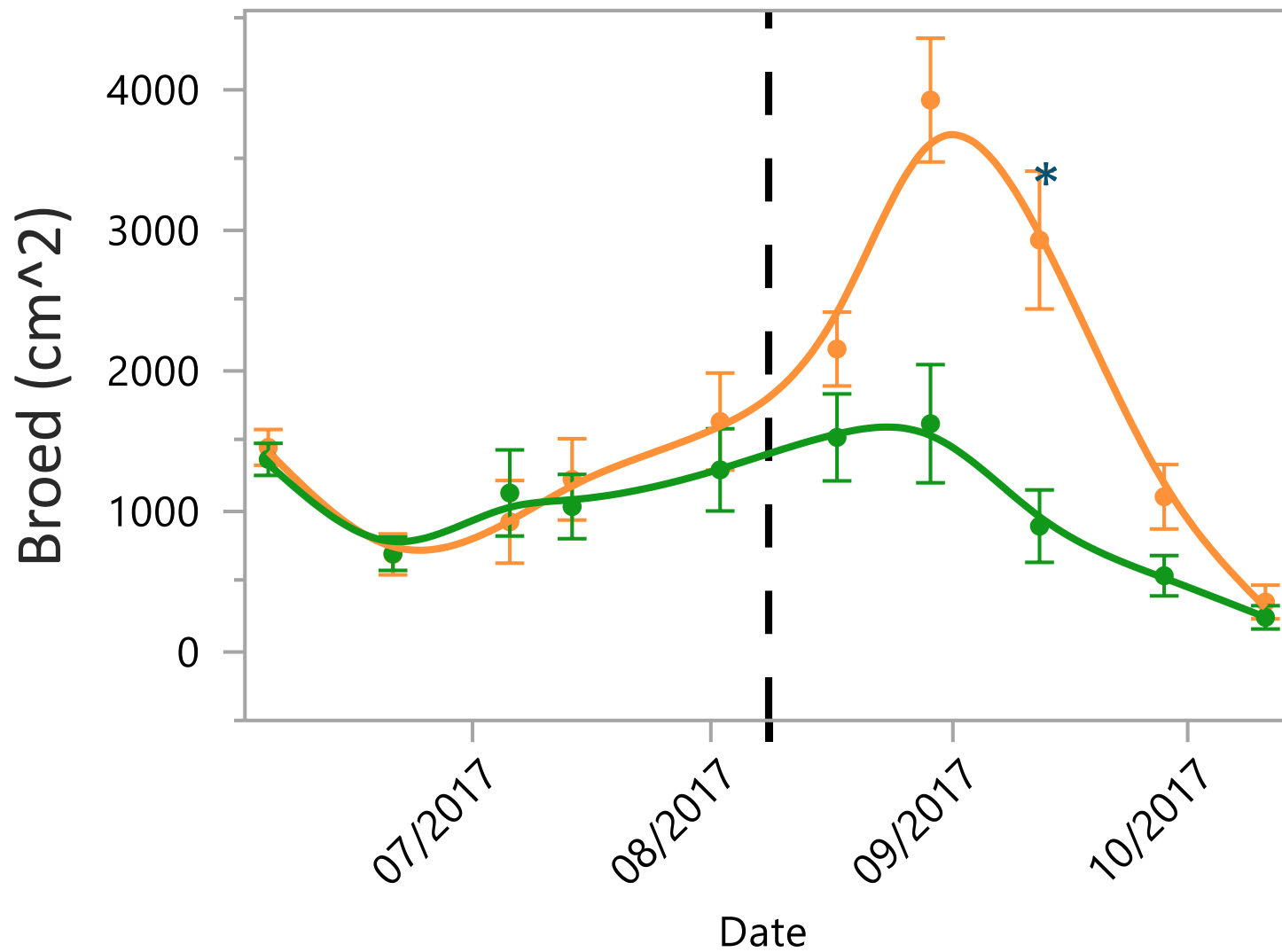


N=24



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— Average Soy — Average Prairie



Prairie/Soy
 $F(1,131)=29$
 $p<0.001^*$



Overwintering

Winter survival



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video winter 2019



OCT 13th 2017

MAY 2nd 2018

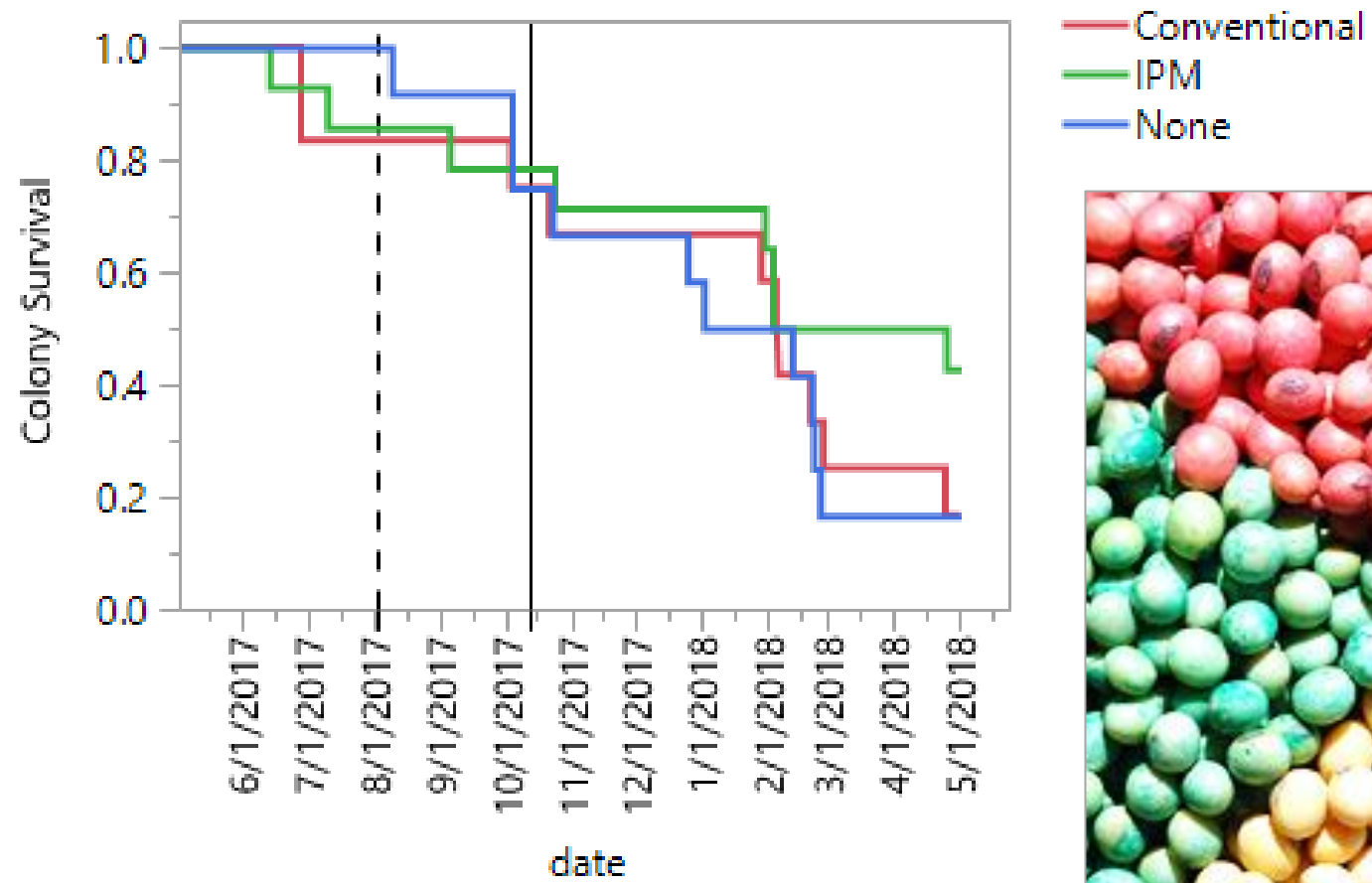


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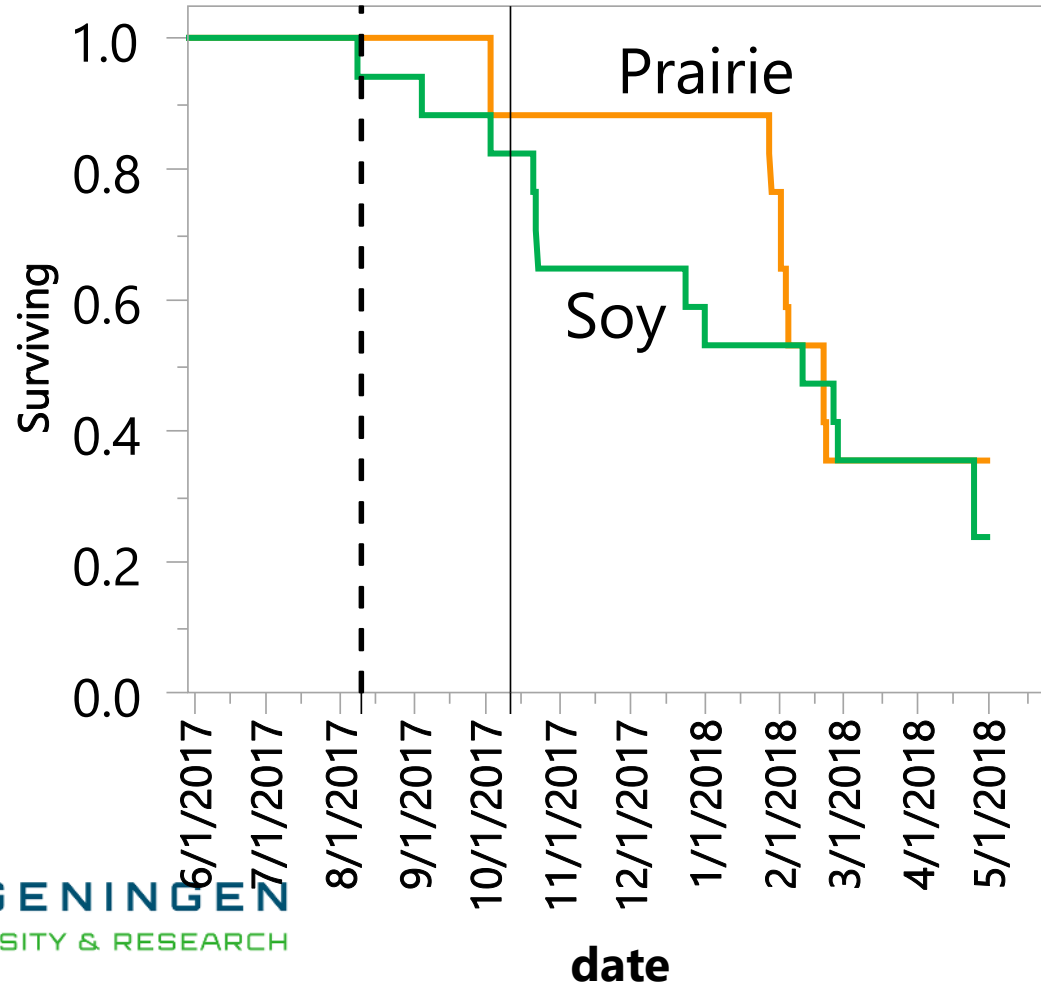
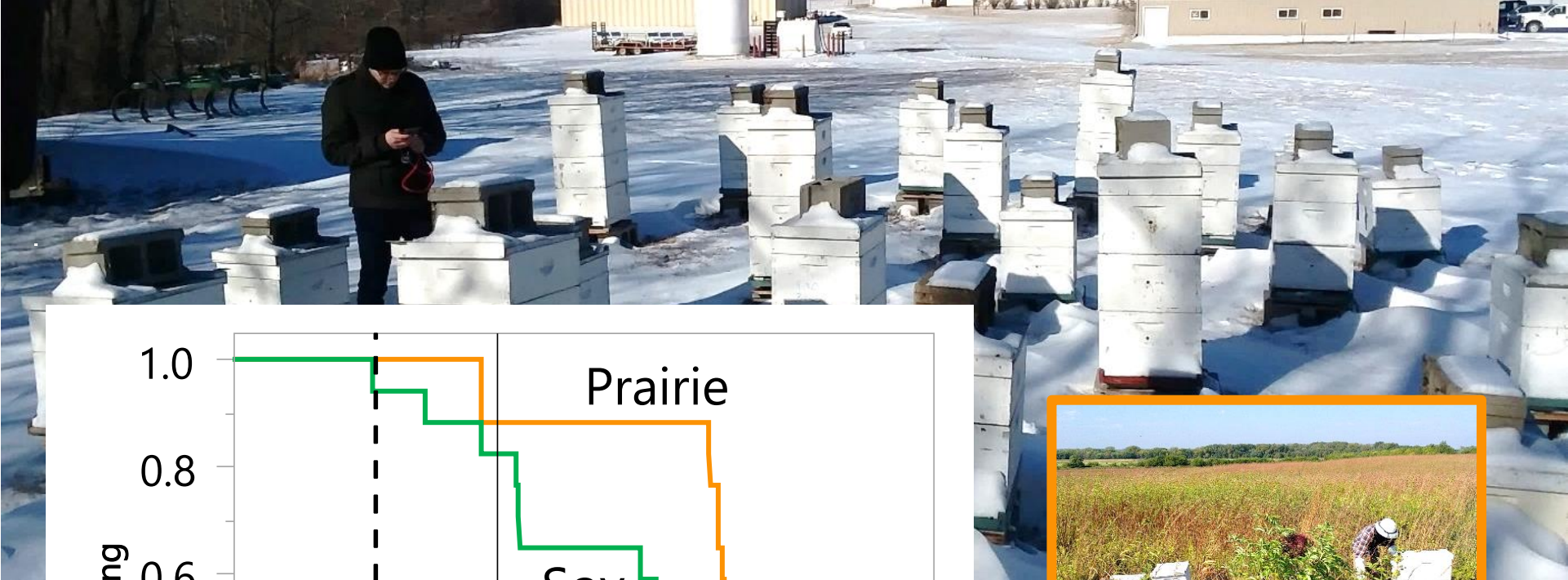


V
U

Survival Plot





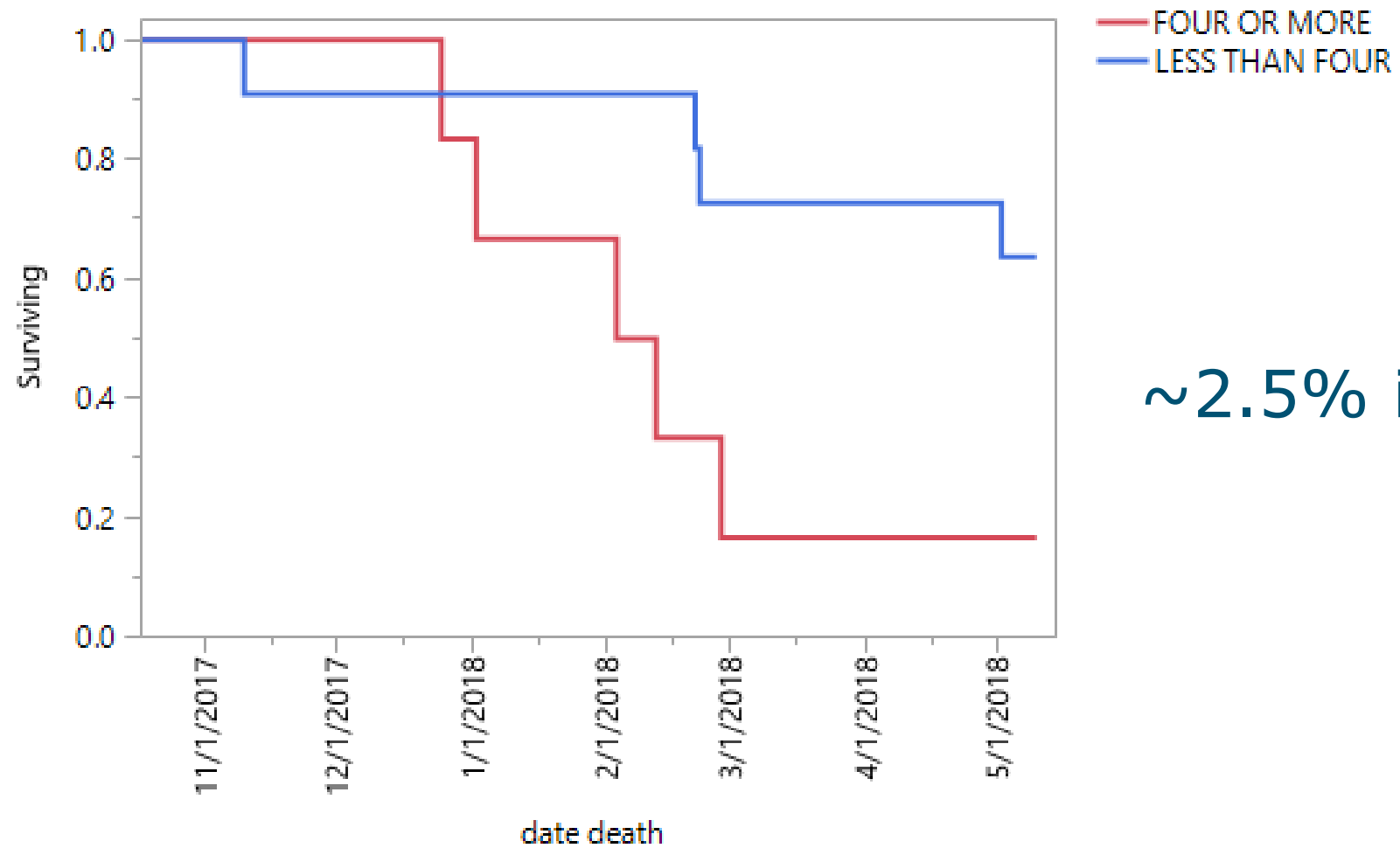




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Survival Plot



~2.5% in Oktober

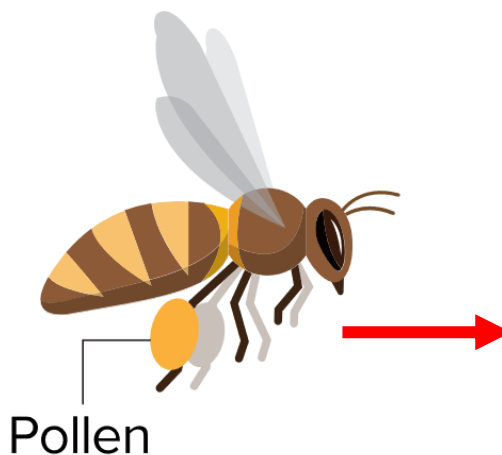
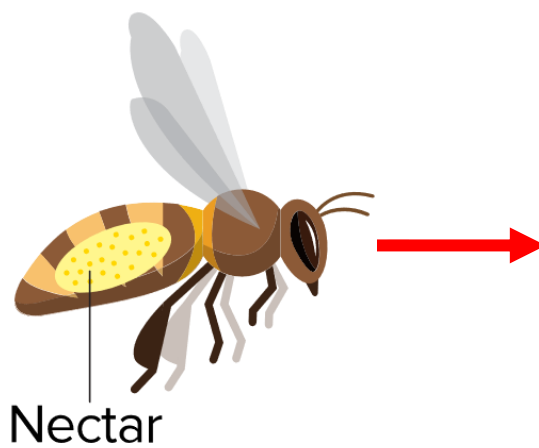
Canada's bee colonies see worst loss in 20 years, explosion of mites blamed

The Canadian Press · Posted: Jul 23, 2022 10:20 AM ET | Last Updated: July 23

“Nearly half of Canada's honeybee colonies didn't survive last winter, according to preliminary data”

“Warm weather in spring 2021 favoured growth of parasitic bug that attacks, feeds on bees”

Wat eten we morgen?



Dank u!



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