



Multifunktionelle dyrkningssystemer kræver øget afgrødediversitet – også på den enkelte mark

# Hvorfor og hvordan kan lokale erfaringer bidrage til bredere omstilling?

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# Behov for multifunktionalitet



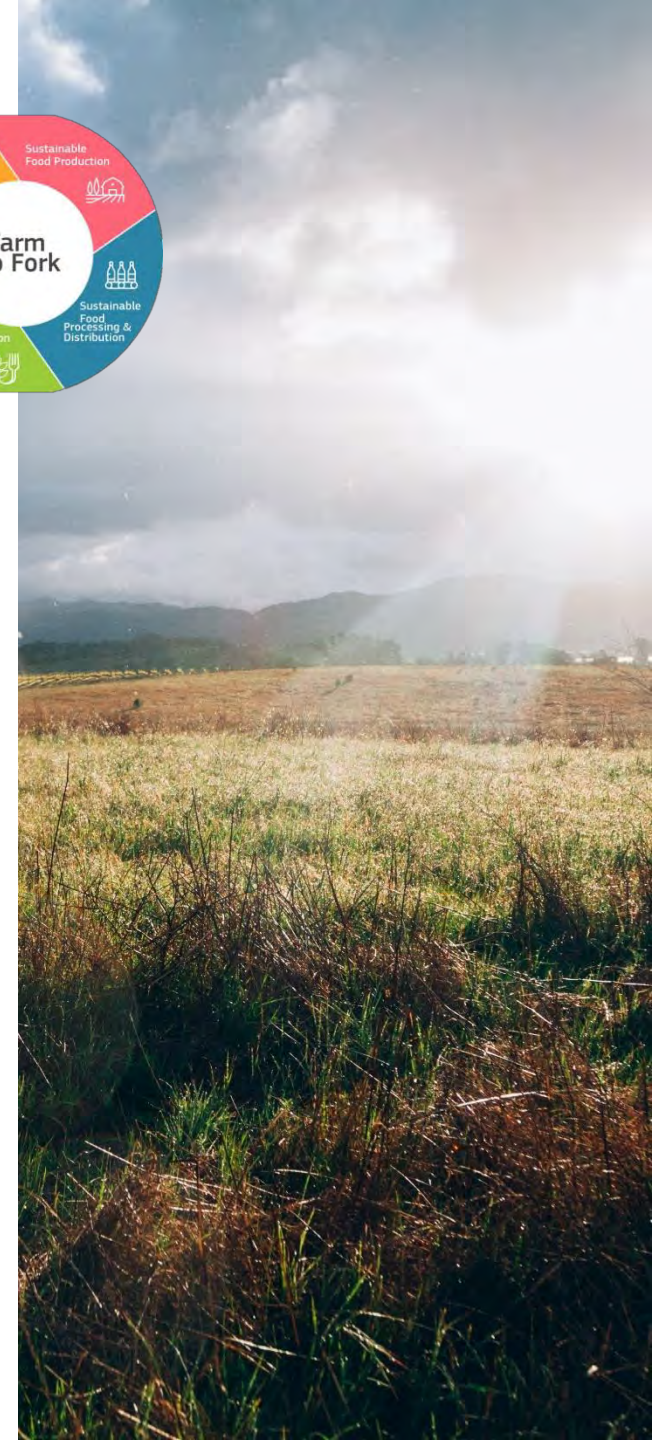
## Politisk pres

- Reduktion af pesticider (50%) og gødning (20%) (EU Farm to fork) samt reduktion af drivhusgasser (55-65%) (DK landbrugsaftale 2021) i 2030

## Potentialer ved samdyrkning

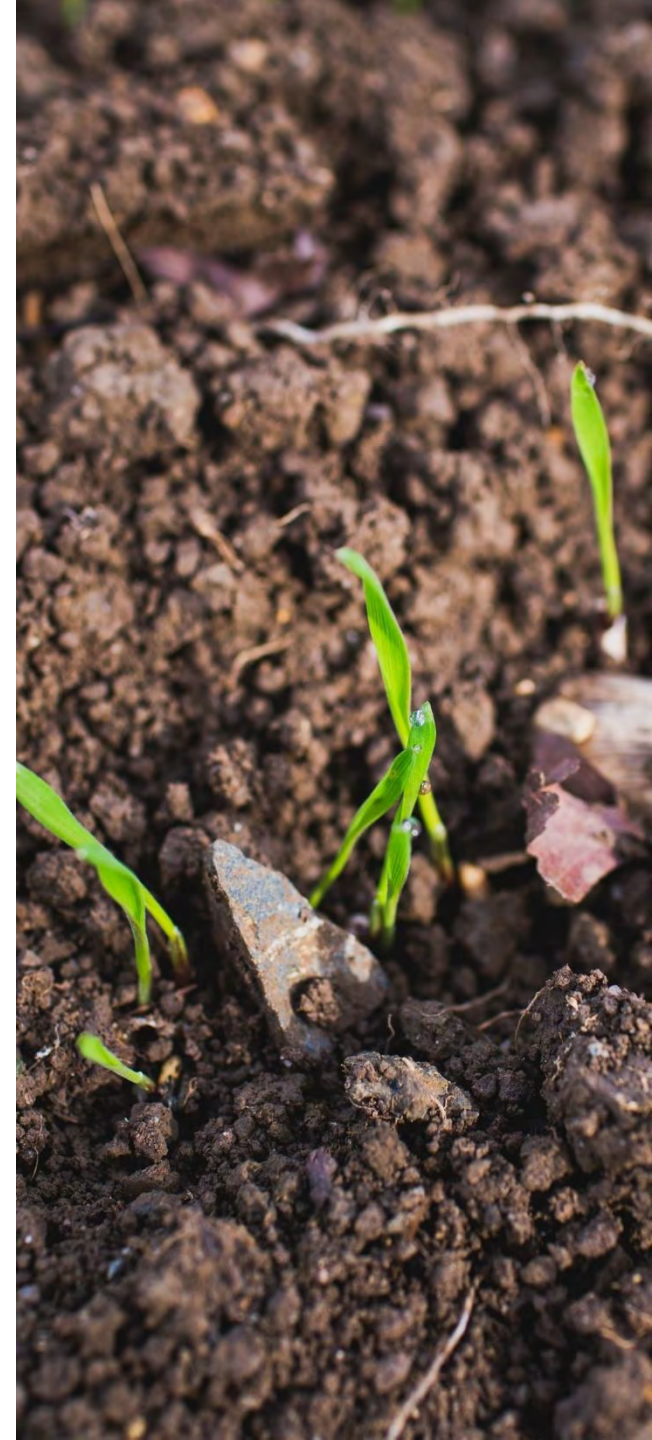
- Øget udbytte (Raseduzzaman & Jensen 2017)
- Reduktion i ukrudt, skadedyr og sygdomstryk (Kremen et al 2012)
- Reduceret behov for inputs (Hauggaard-Nielsen et al 2008)
- Risikospredning og øget resiliens (Kremen et al 2012)
- Integration af bælgfrugter (Jensen et al 2020)

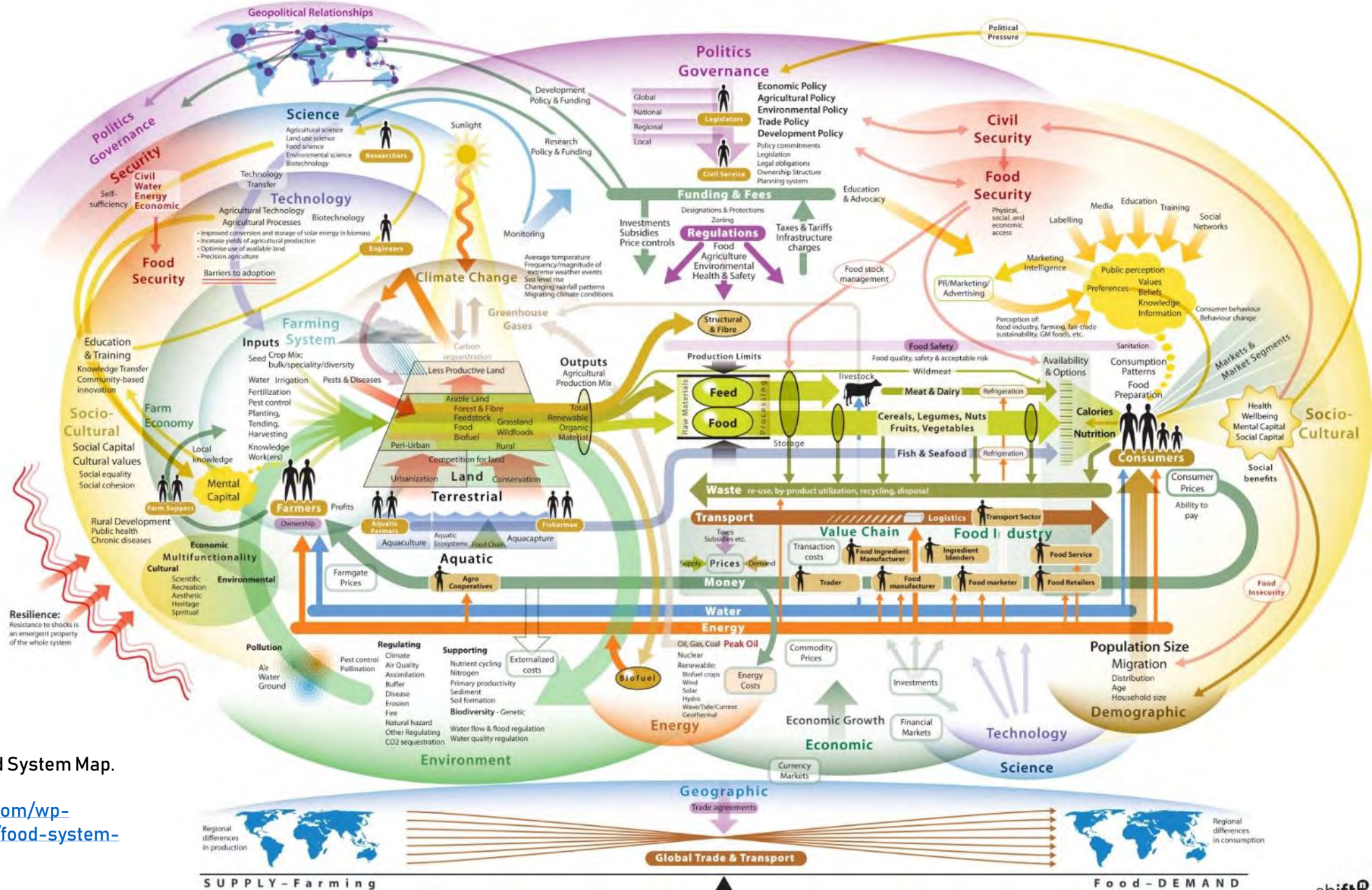
Men multifunktionalitet udfordrer det nuværende system



# Vi ved fra forskningen at ...

- Landmænd er forskellige  
(Aare et al 2021)
- Landmænd lærer i praksis og af hinanden  
(Aare et al 2020; Koutsouris & Zarokosta 2022, Salembier 2023)
- Omstillingsprocesser er komplekse  
(Padel et al 2020)
- Omstilling forudsætter forandring mange steder i fødevarsystemet  
(Aare et al 2023; Aare et al 2020)





ShiftN. (2009). Global Food System Map. Diagram accessed <https://foodtechconnect.com/wp-content/uploads/2010/07/food-system-map4.jpg>

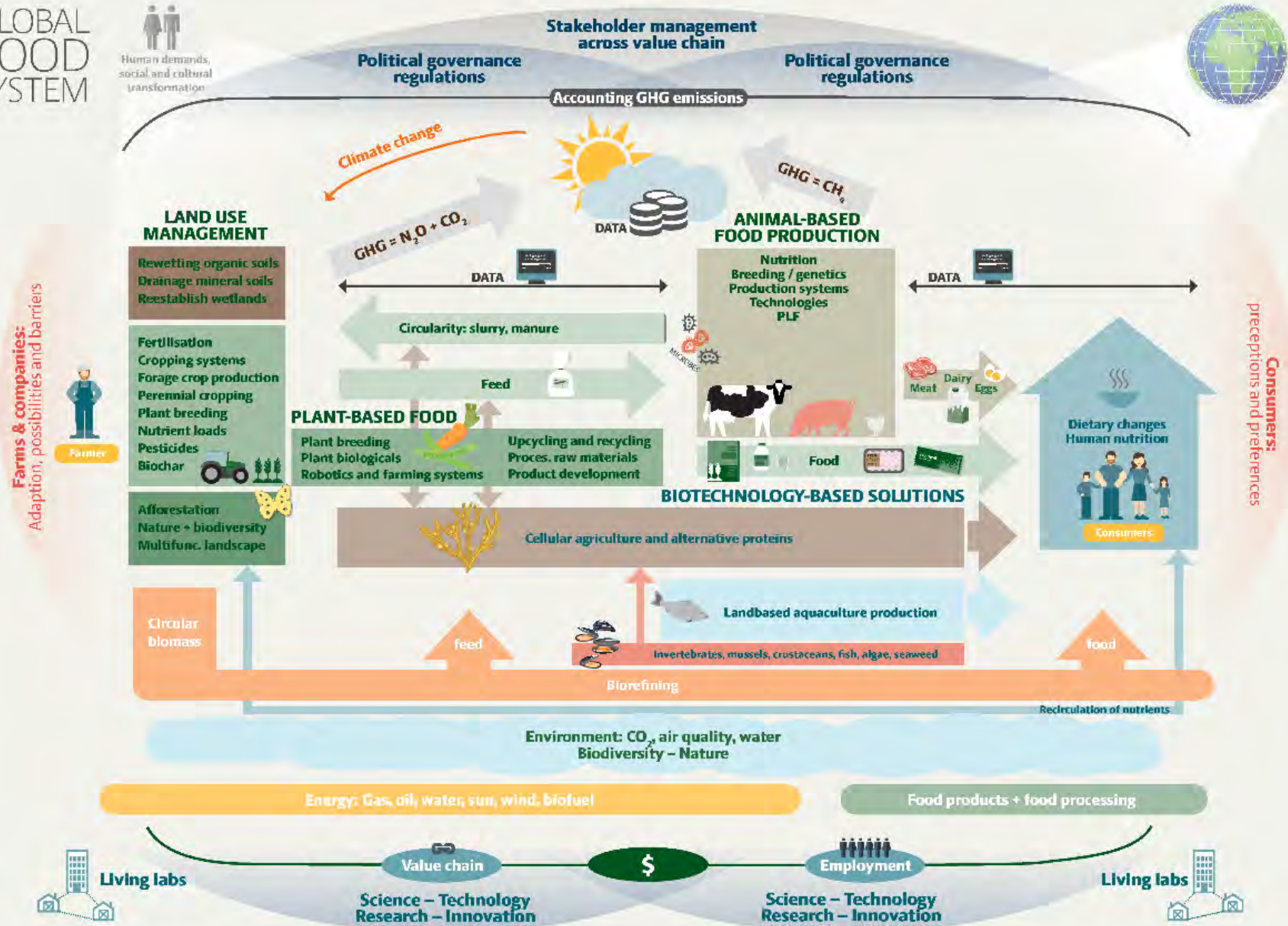


FIGURE 1  
Global food system map illustrating the complex interplay between animal and plant-based food production, land use and management and technological innovations. Solutions can only be obtained in collaboration between sectors and require considerable consumer involvement.

Olesen et al (2021). AgriFoodTure: Roadmap for sustainable transformation of the Danish Agri-Food system. Edited by Rasmussen et al. SEGES, Aarhus, Denmark. 96 pp. [https://pure.au.dk/portal/files/219295609/Climate\\_roadmap\\_white\\_paper\\_06\\_07.2021\\_final\\_version.pdf](https://pure.au.dk/portal/files/219295609/Climate_roadmap_white_paper_06_07.2021_final_version.pdf)



# Udgangspunkt i den konkrete virkelighed

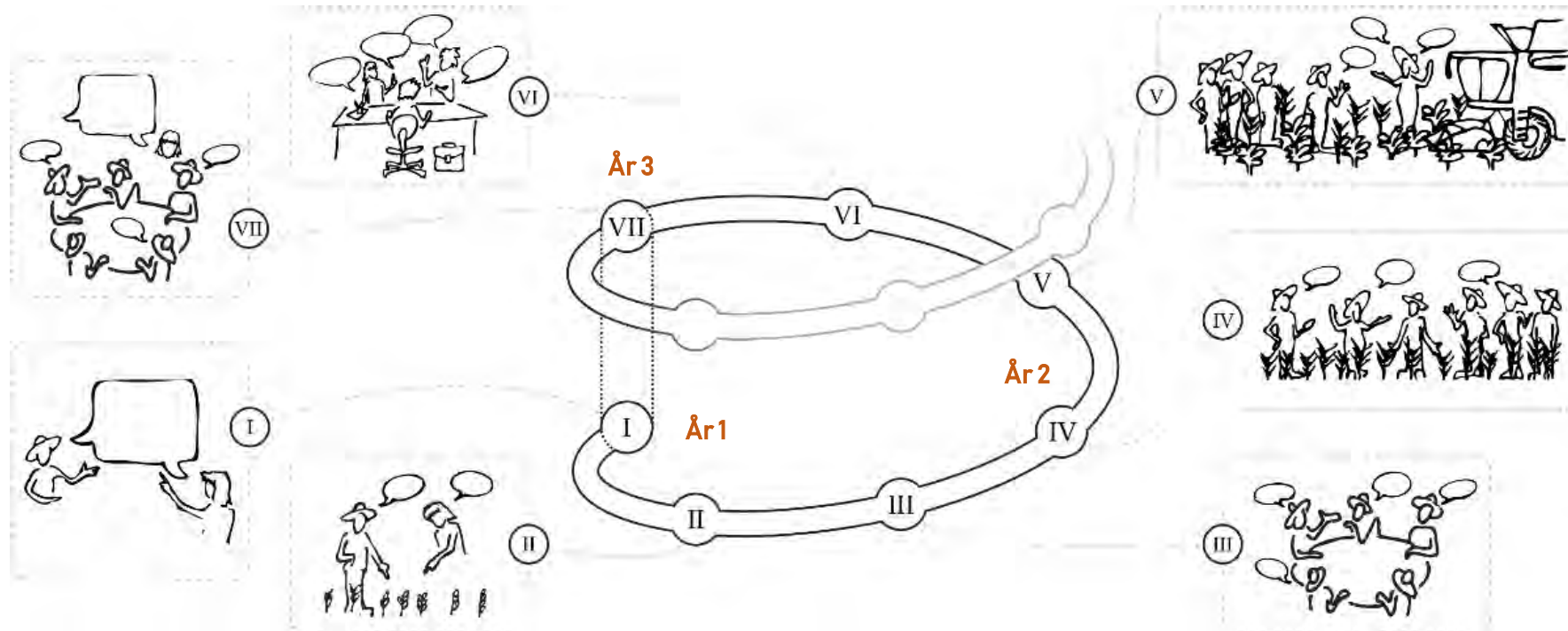
## Living Labs

- Samarbejde over tid
- Fælles ejerskab
- Forskellige kompetencer og viden
- Konkret udvikling og afprøvning af innovation
- Dokumentation

Læringsrum som afsæt for forskningsresultater



# Living Lab blandt landmænd



(Graphical abstract, Aare et al 2021)

## Praksis og mennesker mødes

- Indsigt i personlige og systemiske barrierer
- Adgang til uformel viden
- Udvikling og udveksling af innovation
- Konkret afprøvning og opfølgning
- Tillid til at dele både succes og fiasko
- Opbygning af netværk

(Aare et al 2021)





# Omstilling kræver læring og erfaring

- Forskellige høsttidspunkter → kan nærme sig og/eller håndteres på anden vis (B1)
- Investering i maskiner → samdyrkning kan i høj grad håndteres med nuværende maskiner (B10)
- Krav til foderblanding → lav pris på soya ift. hestebønner (B16)
- Ikke profitabelt → kræver store volumener (B12)

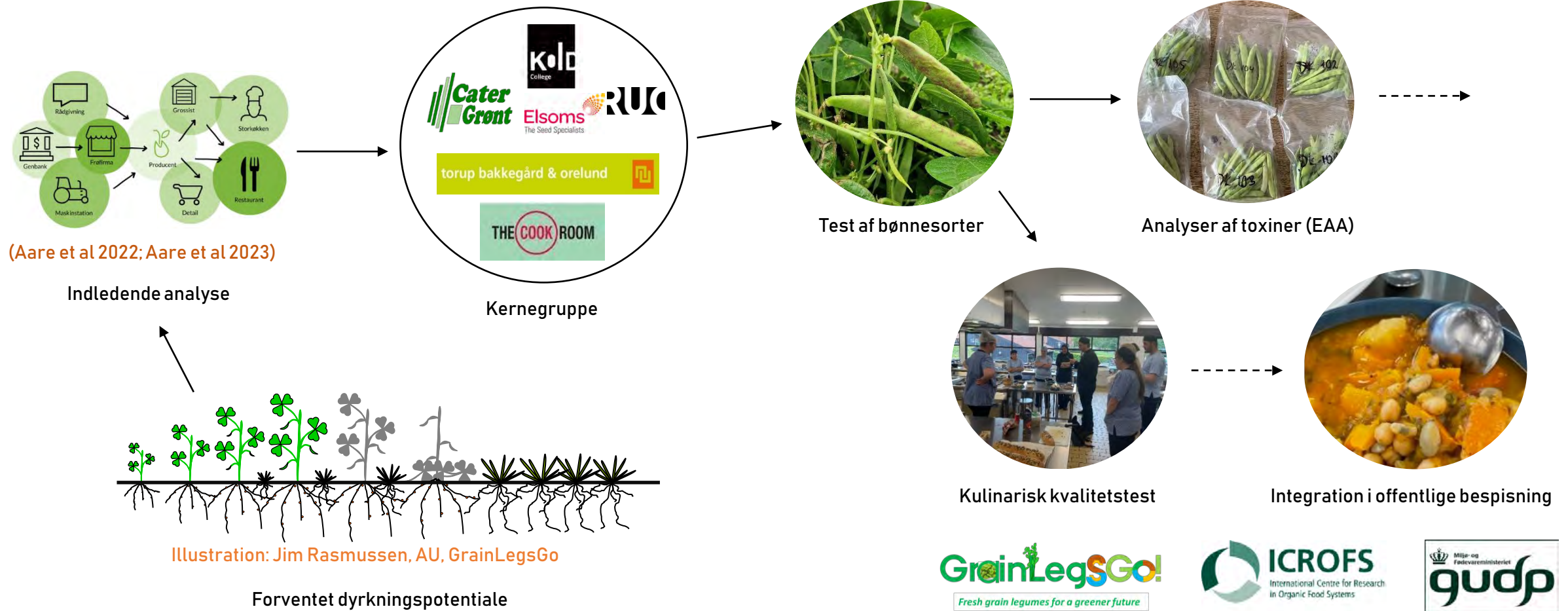
(Aare et al 2021)

**Table 4**

List of barriers to the use of species mixtures in Denmark, as perceived by the farmers at the start of the research process (Activity I) and later revised by farmers in Activity VII. The barriers were categorised by the researchers before being presented to the farmers in Activity III. The revisions made in Activity VII are in italics (elaborations or additions) or strikethrough (no longer relevant).

| Theme                       | ID  | Barriers  |
|-----------------------------|-----|---|
| Technical/<br>agronomic     | B1  | Different species require different harvesting methods <del>and different harvesting times</del>  |
|                             | B2  | Interspecific competition can be difficult to control   |
|                             | B3  | Spraying in species mixtures is challenging e.g. <i>due to the combination of plant families</i>  |
|                             | B4  | Unpredictable weather makes it hard to establish multiple crops   |
|                             | B5  | Using multiple species at the same time increases the proximity of plant families in rotation, increasing the risk of disease   |
|                             | B6  | Some functionalities of species mixtures might not be needed, e.g. N fixing at a livestock farm with surplus N  |
| Logistical                  | B7  | Lack of capacity on the farm (silo, machinery, labour) or possibilities for drying to obtain the correct storable seed quality  |
|                             | B8  | Need for self-supply of cereals for fodder <i>due to exchange rate on the market reducing room in the rotation for other species</i>  |
| Financial                   | B9  | Sorting difficulties (lack of equipment)  |
|                             | B10 | Lack of financial flexibility for experimenting (small scale), due to high investment in seeds <del>and machinery</del> , <i>being time-consuming etc.</i>  |
|                             | B11 | Time-consuming (and expensive) at full scale due to different treatments, sorting etc.  |
|                             | B12 | <del>Not profitable</del> <i>Large volumes needed for species mixtures to be profitable</i>   |
| Market-related              | B13 | Difficult to sell mixtures on the current market (sorting is needed <i>for plant producers</i> )  |
|                             | B14 | Limited sales promotion and offer of seeds <i>specifically</i>  |
|                             | B15 | Not many cash crops on the market, limiting the possible variety of mixtures  |
|                             | B16 | <del>Veterinarian recommendation (e.g. correct composition between species)</del> <i>Soy is so cheap that the cost price of home-grown protein cannot compete, which limits livestock farmers' use of local protein crops</i> |
|                             | B17 | Grains/seeds for breeding contracts need to comply with high purity standards that are difficult to achieve in sorted mixtures  |
| Political/<br>institutional | B18 | Strict regulations reduce the possibility of managing fields according to local needs   |
|                             | B19 | No political support or reward for working with species mixtures  |
|                             | B20 | Template for reporting fertiliser application for EU does not allow for registration of more than one species   |
|                             | B21 | Lack of focus on species mixtures in extension service and national on-farm experiments   |
| Cultural/social             | B22 | Judged harshly by colleagues if you differ from the norm  |
|                             | B23 | Average age of farm owners hinders innovation in the sector   |
|                             | B24 | Actors in the sector require evidence before implementing/supporting new innovations  |
|                             | B25 | Species mixtures require farmers to have a new mindset  |
|                             | B26 | Lack of interest among farmers (incl. attitudes, ideology, conservatism and habits)   |
|                             | B27 | Conservative education system and advisory service (both agricultural schools and universities place a great focus on productivity alone)   |
|                             | B28 | Catch crops' reputation among farmers as "harassment crops"   |
|                             | B29 | Uncertainty about the impacts/effects of species mixtures   |
| Knowledge-related           | B30 | Lack of experience of and knowledge about mixtures (e.g. <i>what mixtures work for what purpose, what varieties work in mixtures</i> )  |
|                             | B31 | Lack of concrete advice and guidance  |
|                             | B32 | Lack of inspiration and ideas (e.g. <i>in Danish farmers' experience</i> )  |

# Living Lab på tværs af værdikæden



# Konklusioner fra kernegruppen

- Dyrkningspotentiale, men problemer med høst
- Svær håndterbar afgrøde pga. kort holdbarhed og skrøbelig bælg
- Lille marked pga. bl.a. international konkurrence (frost) og manglende kvalitetsforståelse
- Uudnyttet forædlingspotentiale
- Manglende viden og anbefalinger om kvalitet, næringsindhold og toxiner
- Behov for koordineret indsats på tværs af kæden f.eks. anbefalinger

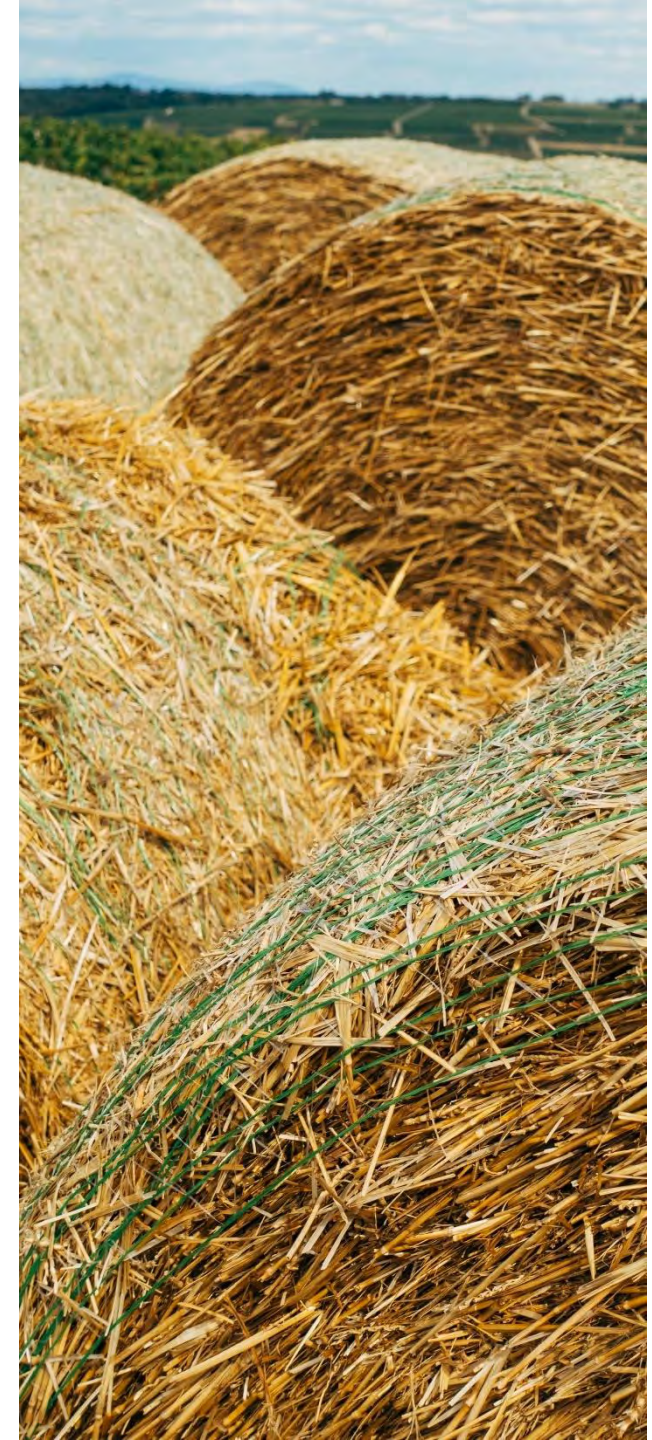
(Aare et al 2024, under udarbejdelse)





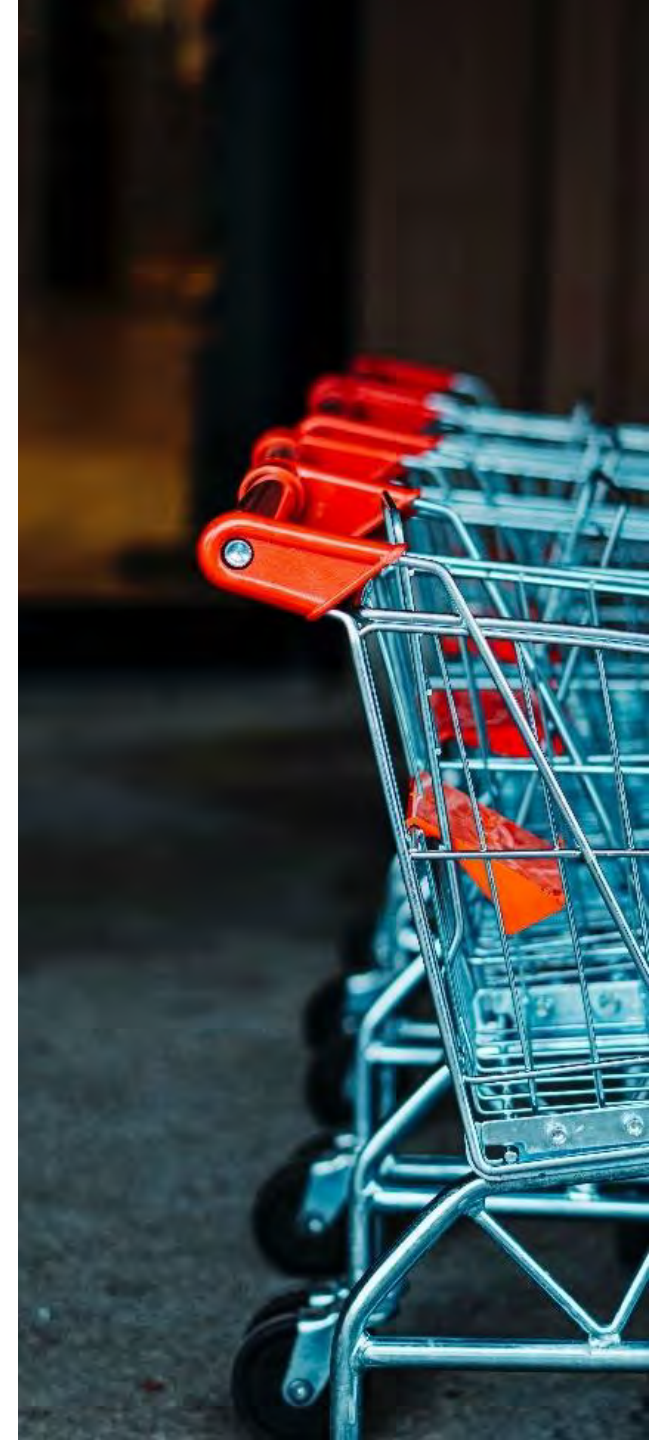
*'I virkeligheden er det vi skaber (...) et forum, der er en slags smelting for idéer. Ja, noget som der ellers ikke havde været incitament til at investere tid og penge i.'*

**- Forædler i GrainLegsGo**



# Forandringspotentiale?

- Plads til at udfordre det nuværende system
- Etablering af konkrete nye erfaringer
- Dialogskabende (horisontalt og vertikalt)
- Forståelse for kontekstens betydning
- Indsigt i kompleksiteten
- Forskning som en rejsekuffert





# Referencer

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Afgrødediversitet, er det en ny normal ?



# Hvem er vi:

- Ejendom i det sønderjyske hvedebælte på 130 ha.
- Kystnær placering, kuperet stiv lerjord.
- IPM brug, fokus på rajgræs.
- Maskinsammenarbejde med min onkel Jørgen og min fætter Rasmus konv. Og økologisk.
- Meget blandet maskinpark.
- Mange afgrøder i fællesskabet.



# Hvor kom vi fra:

- Sædskifte 5% vårsæd 20% raps 75% hvede.
- Plov + rotorharve, grubbesået raps.
- Salg af halm.
  
- Gjorde vi noget rigtigt...

# Hvor har vi været de sidste par år:

- Sædskifte 5% bestøver brak, 5% vårbyg, 20% havre, 20 % bønner 10 % vinterbyg 40% hvede. (ca. 51 % efterafgrøde krav)
- Opbygning af et klima- og græsmæssigt stærkt sædskifte.
- Øget fokus på diversitet over og under jorden
- Gætte leg...
  - Nye observations vinduer.
  - Nye erfa grupper.
  - Hvad gør man udenfor DK.
- Direkte såning, problem knuser?
- Arbejde med de første succeser.

# Hvordan kom jeg i gang ?



- En tur over Storebælt
- Network
- Remix
- Google
- Youtube 😊
- Nye bekendskaber

# 1. Samdyrkede afgrøde.

**Hestebønne med vårhvede**



**I vognen**



År. 2020 Bønne/Havre. Klassisk Byg/ært.  
År. 2021-2022. Undersåning af kløver  
År. 2023 Vikke/Triticale



# Hvad har jeg tænkt på mange gange

- Ukrudt..
- Ukrudt...
- \$\$\$ eller udbytte
- Høsttidspunkt, bliver det modent
- Sundt sædskifte
- Jordbearbejdning
- Gødskning, tester eller biomasse

Svipser.... 😊



# Nye afprøvninger

## **Ny Inspiration**

- Jason Mauck @jasonmauck1
- Frederik @fredvlarsen
- Afgræsning
- Living mulch
- Kemi vs.ingen kemi
- Alley cropping

- Ændringer sker først når du erkender der er et behov for at ændre

Gi' ikke op... Vi skal videre.

