Programme & summaries

CropMix

Consortium meeting 27 November 2025

Programme

09:30 – 10:00:	Walk-in with coffee and tea
10:00 – 10:10:	Welcome and opening
10:10 – 10:30:	Introduction to themes by Marius Monen and PJ Beers: Production, efficiency and biodiversity
10:30 – 11:15:	Round 1 presentations of results
11:15 – 11:30:	Coffee break
11:30 – 12:30:	Round 2 presentations of results
12:30 – 13:30:	Lunch
13:30 – 14:15:	A look at 2040 with Peter Harry Mulder & Edwin Tigchelaar
14:15 – 15:00:	Back casting
15:00 – 15:15:	Break
15:15 – 16:00:	Plenary closing
16:00:	Drinks

Summaries presentations by PhD candidates 27 November 2025

Disclaimer: These results are preliminary and not public. We kindly request that you do not share the results without the permission of the researchers concerned.

Theme: Biodiversity

Rik Waenink – Natural pest control and bird biodiversity in strip cropping

We compared natural pest control in cereals and potatoes in strip-cropped and monoculture fields across 22 farms in The Netherlands. Strip-cropped fields encompassed a variety in strip widths, number of crops and farming systems. Overall, cereal and potato herbivores and natural enemies were more abundant in strip-cropped than in monoculture fields. Strip cropping enhanced natural pest control; increasing predator abundance per pest individual (+27–85%) egg predation in potato (+15%) and natural enemy diversity (+9–17%). However, Colorado potato beetle was a notable exception, with threefold higher abundance in strip cropping but no correlation with natural enemy abundance. Insects showed the strongest increase in strips of 3–12 meters and strips in conventional systems, but were not affected by the number of crops within the strip cropping arrangement. Our results demonstrate that crop diversification through strip cropping increases insects abundances across trophic levels, supporting more functionally diverse and balanced agroecosystems that enhance natural pest control.

In addition, we analysed insect and bird biodiversity in strip cropping. Strip cropping increases insect abundance per insect group (+30%) and species richness (+15-30%). Bigger insects show large increases with strip cropping (+50-100%). The number of breeding birds on strips is double of that of monocultures. Breeding birds prefer wide/conventional strips over narrow/organic strips.

More info: https://cropmix.nl/en/onderzoek/werkpakketten/werkpakket-1-agro-ecologie/de-waarde-van-strokenteelt-voor-akkervogels/

Thijmen van Loon – Designing biodiverse landscapes

Increasing crop diversity can make an important contribution to biodiversity at the landscape level. It is important that crop diversity is increased at different spatial scales. In our initial research, we developed an optimisation model that calculates which adjustments to crop rotations are optimal for increasing crop diversity at different scales. We looked at two options: 1) growing new crops 2) continuing to grow the same crops but combining them in the same field each year. We did this for a case study in Lelystad using BRP data from 544 fields and 58 arable farms.

Our calculations show that a trade-off is always present: what works well for one scale does not yield the best results for the other scales. Adding new crops has the greatest impact at higher scales. Growing multiple crops in a single field – like with strip cropping – increases diversity, especially on a small scale, but the effect diminishes at larger scales. Most studies on this subject have not yet included this second option. Our results show that techniques such as strip cropping are very important for increasing crop diversity on multiple scales in an agricultural landscape.

More info: https://cropmix.nl/en/onderzoek/werkpakketten/werkpakket-2-socio-economie-technologie-en-logistiek/onderzoek-inrichten-van-agrarische-landschappen/

Theme: Production

Franca Bongers – Predicting productivity consequences with modelling

Why do we use models, and what can they do? We want to understand the mechanism (processes) that underly development, growth and eventually yield performance of different cropping systems. We also want to predict yield across variation in soil, climate and management. With modelling we can explore beyond real experimental units, in terms of species competition and climatic conditions. So modelling is a great tool to explore how and what strip cropping yield beneficial systems.

3D plant modelling uses specific plant structure in 3D space, mechanistic processes that drive physiology and the interaction with the environment. In strip cropping and intercropping, plants of the same and of different species compete for resources, both above and below ground. During crop development, plant compete for these resources which affect each individual plant and consequently the growth of the whole canopy.

Within Cropmix we focus on quantification of microclimate effect (Ana), root trait effects (Kostas) and species combinations and farm level consequences of strip cropping (David).

Overall, the role of using 3D modelling is not to predict absolute yield, but to quantify the effect of strip cropping compared to monocropping. We can quantify various management and design options, that have influence om plant growth via resource availability and competition, such as strip and row width, sowing and harvesting times, fertilization differences.

More info: https://cropmix.nl/en/onderzoek/werkpakketten/werkpakket-1-agro-ecologie/onderzoek-modellering-van-belangrijke-ondergrondse-ecologische-processen-in-gewasmengsels/ &
https://cropmix.nl/en/onderzoek/werkpakketten/werkpakket-1-agro-ecologie/onderzoek-optimaliseren-van-microklimaat-geinformeerde-intercropping-systemen-voor-duurzame-landbouw/

Camilla Bodewes – The role of the consumer

CropMix aims to create an integrated and sustainable agrifood production system. In a project with a central focus on sustainable food production, people may initially seem distant. However, CropMix' pronounced systems perspective on food production makes clear that its activities are inherently connected to the people who consume food, or *consumers*. Including people *in their role as consumers* in transition projects such as CropMix is therefore essential. This raises several questions. How can *consumers* be involved in the agrifood transition, particularly when approached from a systemic perspective? What is our own role in incorporating consumers into transition activities? And what are images about ourselves and others that we carry into our transition efforts? These questions, and more, form the core of the research I will present today. Together we will explore the role of *consumers*, our own role as researchers and practitioners, and how these perspectives interact. We will reflect on the world as we know it and the world as we think we know it. By the end, perhaps nothing will seem to make sense anymore, which may be the perfect condition for change to happen.

More info: https://cropmix.nl/en/onderzoek/werkpakketten/werkpakket-3/maatschappelijke-actoren/

Daphne Schoop – Institutional frameworks and relationships

Increasing the diversity in cropping plans in The Netherlands is the objective of CropMix and the wider agricultural transition agenda. To achieve the fundamental change in cropping practices towards diverse cropping practices such as strip cropping, we need more than just knowledge and technology; it is just as much a matter of working on social and organizational dimensions. The enabling and constraining relationships, interactions, cultural norms and organizations have to be actively constructed (or deconstructed) by a wide range of actors in society.

Taking the farming systems in CropMix as a starting point in my research, I study crop diversification through a (social-symbolic) work perspective, by which I explore the work on relationships and institutions by farmers and other actors at the farm level. Since I am in the midst of data collection at this moment, my presentation will contain preliminary insights, hopefully contributing already to a fruitful discussion and reflection on activities, roles and the work of transitions within and beyond CropMix.

More info: https://cropmix.nl/en/onderzoek/werkpakketten/werkpakket-3/institutionele-kaders/

Theme: Efficiency

Lisa Marijke van den Berg – Technology readiness

This research investigates where technology can support the transition to strip cropping, identifies current barriers, and explores strategies to overcome them. Most agricultural technologies are designed for monocultures, while existing solutions for diverse cropping systems were not developed with strip cropping in mind. The study examines perspectives from both farmers and technology developers.

Findings show that farmers vary in how technology integrates into their systems; sometimes technology follows the cropping system, other times vice versa. Common technological challenges include irrigation and harvest, while some other challenges are resolved through changes in cultivation practices rather than technical fixes. Farmers often modify machines themselves, collaborate with professionals, or seek collective solutions. Our insights highlight that technology can support the transition towards diversified systems in some parts of the challenges experienced by farmers but is not the sole answer.
Understanding technology needs and gaps enables targeted innovation, fostering crop diverse systems accelerating the transition to sustainable farming. In this presentation we share insights and progress on the design projects we are working on.

More info:
https://cropmix.nl/en/onderzoek/werkpakketten/werkpakket-2-socio-economie-technologie-en-logistiek/onderzoek-inrichten-van-agrarische-landschappen/

Tugce Canbilen Suticen – Distribution networks

Mixed-cropping systems introduce substantial supply chain challenges, as the greater crop diversity and smaller batch sizes at the farm level complicate transportation and storage activities. This complexity often necessitates exploring alternative sales channels, such as short food supply chains (SFSCs), whose costs and benefits must be carefully assessed. To evaluate these options and manage the added complexity, my PhD project aims to develop models that optimize the key supply chain decisions and support decision-making in designing distribution networks for mixed-cropping systems. Results from the first part of the project show that mixed-cropping systems can better align supply and demand in the SFSC and illustrate how such models can be used to analyze the system under different conditions, including changing unit sales prices and demand patterns.

More info:
https://cropmix.nl/en/onderzoek/werkpakketten/werkpakket-2-socio-economie-technologie-en-logistiek/onderzoek-efficiente-distributienetwerken-van-op-gemengde-teeltsystemen-gebaseerde-toeleveringsketens/