



Co-Design to Identify Lack Of On-Farm Agronomic References

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Why ?

Hypothesis 1: the reason why farmers do not use some techniques, except farm machinery availability, is that they need more references in their combination of cropping system (CS) and soil.

Hypothesis 2:

The references that they need are not obvious enough to be identified through a simple survey such as “what do you want /need to know to be able to improve your CS?”

Hypothesis 3:

Wondering and arguing about introducing a new technique that could improve a CS is a relevant way to detect the reason(s) why it is not already used.

Hypothesis 4:

Several types of references may be needed about a new technique to judge if it can introduce in a given combination of CS and soil:

- the technique efficiency according to its objective(s),
- the conditions for which the technique is efficient and feasible,
- its potential side effects.



Adapted from Kneebone, S., 2012.

How ?

- The second step of the STEPHY approach, initially developed to co-design CS for low pesticide use, was enlarged to other farmers' objectives such as reducing nitrates leaching or avoiding resistance development to herbicides in weeds population
=> data on suitable techniques were compiled according to the types of references for each potential objective.
- main objectives of each farmer were identified.
- each farmer argued the reasons why it has not or do not consider introducing each proposed technique in a chosen CS.

Which results ?

Open or closed ended questions such as: “does sunflower introduction need to be combined with mechanical weeding to reduce herbicide use in Rapeseed/ Wheat/ Winter barley/ Pea/ Wheat rotation on a chalky soil?”

Those questions have been presented to the farmers' group as a feedback for complements and validation.

| Objective | Technique | CS* soil | Technique efficiency | Conditions for which the technique is | | Potential side effects |
|----------------------|-----------------------------------|--|----------------------|---------------------------------------|----------|------------------------|
| | | | | Effective | Feasible | |
| Reduce herbicide use | sunflower introduction | RS/ WW/ WB/ SP/ WW ² Chalky soil | No herbicide ? | Mechanical weeding ? | ? | |
| | 2 winter crops/ 2 spring crops | RS/ WW/ WW/ WB/ SB ² Chalky soil | | | | Economical impact ? |
| | ... | ... | ... | ... | ... | ... |

What is next ?

Choice of :

techniques of interest

CS * soil to test them

what to observe and measure

¹ Kneebone, S. 2012. Extension systems and change facilitation *in* DARNHOFER, I., GIBBON, D., DEDIEU, B. (Eds). Farming Systems Research into the 21st Century : The New Dynamic. Dordrecht Heidelberg New York London : Springer. p212

² RS = rapeseed, WW = winter wheat, WB = winter barley, SP = spring pea, SB = spring barley