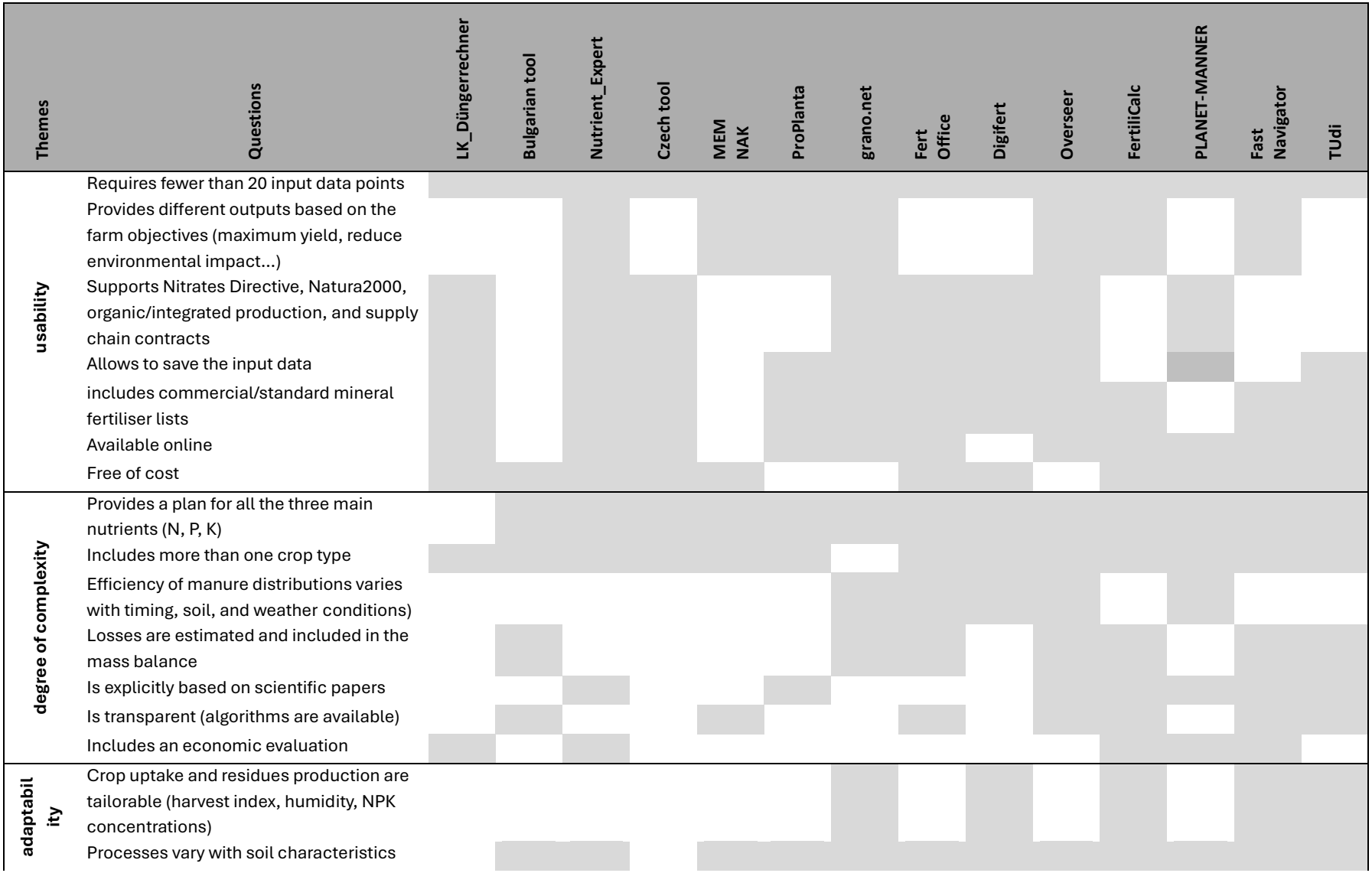
Table 1 *Evaluation of the characteristics of NMP tools (white = absence, grey = presence)*



Themes	Questions	LK_Düngerrechner	Bulgarian tool	Nutrient_Expert	Czech tool	MEM NAK	ProPlanta	grano.net	Fert Office	Digifert	Overseer	FertiliCalc	PLANET-MANNER	Fast Navigator	TUdi
	Processes vary with climate characteristics														
	Manures within a category are tailorable at a farm level (sub-categories, NPK concentrations…)														
	Was tested in at least two different environments														
	Can be used in different languages														
interoperability	Is linked to local databases as input (farm data, soil data…)														
	Is linked to other modules as outputs such as Green House Gases, nutrient losses, irrigation requirement, manure storage capacity														
	Is linked to modules/applications with a greater time detail (e.g. fertilisation timing)														
	Is linked to modules/applications that enable forecasting analyses														

Table 2 *Evaluation of the processes of NMP tools (white = absence, grey = presence)*

Nutrient	Process	LK_Düngerrechner	Bulgarian tool	Nutrient Expert	Czech tool	MEM NAK	ProPlanta	grano.net	Fert Office	Digifert	Overseer	FertiliCalc	PLANET-MANNER	Fast Navigator	TUdi
N	SOM mineralisation														
	Previous crop residues														
	Past year organic fertilisation														
	Initial mineral soil contribution														
	Atmospheric deposition														
	N-fixation														
	Irrigation														
	Leaching														
	Volatilisation														
	Denitrification														
	Immobilisation														
	Is part of the mineral fertiliser considered as inefficient?														
	Is part of the manure considered as inefficient?														
P	Previous crop residues														
	Mineral soil contribution														
	Runoff erosion														
	Is part of the mineral fertiliser considered as inefficient?														
	Is part of the manure considered as inefficient?														
K	Previous crop residues														
	Mineral soil contribution														
	Is part of the mineral fertiliser considered as inefficient?														
	Is part of the manure considered as inefficient?														

Table 3 *Evaluation of the inputs of NMP tools (white = absence, grey = presence)*

Category	Input	LK_Düngerrechner	Bulgarian tool	Nutrient Expert	Czech Republic	MEM-NAK	ProPlanta	Digifert	Fert Office	grano.net	Overseer	PLANET - MANNER	FertiliCalc	Fast Navigator	TUdi
FARM	Farm identification														
	Field identification														
	Field surface														
	Location														
CROP	Crop type														
	Crop yield														
	Sowing date														
	Cropping system														
	Previous crop type														
	Previous crop yield														
	Previous crop management														
SOIL	Soil texture class														
	Soil depth														
	Field slope														
	SOM content														
	Total N content														
	pH														
	Available P content														
	Exchangeble K content														
	CEC														
IRRIGATION	Irrigation method														
	Irrigation amount														

Category	Input	LK_Düngerrechner	Bulgarian tool	Nutrient Expert	Czech Republic	MEM-NAK	ProPlanta	Digifert	Fert Office	grano.net	Overseer	PLANET - MANNER	FertiliCalc	Fast Navigator	TUdi
	Irrigation water N concentration														
T I -	Type														
CLIMATE	Total annual precipitation														
	Total winter precipitation														
	Annual mean temperature														
	Annual atmospheric N deposition														
MINERAL FERTILISERS	Fertiliser type														
	Fertiliser dose														
	Fertiliser NPK concentration														
	Fertilisation strategy for P and K														
	Fertiliser distribution method														
ORGANIC FERTILISERS	Fertiliser type														
	Fertiliser dose														
	Fertiliser NPK concentration														
	Fertiliser distribution method														
	Fertiliser distribution timing														