

## Balancing organic agriculture expansion target and climate goals in Europe without outsourcing emissions is possible

### Supplementary Material B : land use and greenhouse gas emissions (figures 2 and 3)

Noélie Borghino\*, Chantal le Mouél, Agneta Forslund, Pietro Barbieri, Florence Garcia-Launay, Guillaume Martin, Bertrand Méda, Bertrand Dumont, Patrick Meyfroidt, Alice Josserand, Thomas Nesme

Source : Authors' calculations

#### Data Figure 2 - land use in Europe

Scenario	Organic variant	land use	Area (Million ha)
2010		cropland	127.0918
2010		permanent grassland	71.8356305
2010		shrubland	23.13506453
2010		forest	203.2565564
REF		cropland	146.8366346
REF		permanent grassland	67.56829894
REF		shrubland	13.75438853
REF		forest	197.1597293
OAU	25	cropland	155.5703262
OAU	25	permanent grassland	68.69657898
OAU	25	shrubland	13.75438853
OAU	25	forest	187.2977577
OAU	50	cropland	169.5058012
OAU	50	permanent grassland	71.55450317
OAU	50	shrubland	13.05272311
OAU	50	forest	171.206024
CIRC	No expansion	cropland	127.5972168
CIRC	No expansion	permanent grassland	56.7682823
CIRC	No expansion	shrubland	37.69699591
CIRC	No expansion	forest	203.2565564
CIRC	25	cropland	135.82223
CIRC	25	permanent grassland	61.05326807
CIRC	25	shrubland	25.18699699
CIRC	25	forest	203.2565564
CIRC	50	cropland	148.8327082
CIRC	50	permanent grassland	67.04414663
CIRC	50	shrubland	15.02365329
CIRC	50	forest	194.4185433
DIV	0	cropland	127.5972168
DIV	0	permanent grassland	56.7682823

DIV	0 shrubland	37.69699591
DIV	0 forest	203.2565564
DIV	25 cropland	135.5630608
DIV	25 permanent grassland	62.41629671
DIV	25 shrubland	24.08313748
DIV	25 forest	203.2565564
DIV	50 cropland	148.5798273
DIV	50 permanent grassland	64.63101109
DIV	50 shrubland	16.30219903
DIV	50 forest	195.8060141
VEGET	0 cropland	126.1493584
VEGET	0 permanent grassland	53.57363551
VEGET	0 shrubland	42.33950113
VEGET	0 forest	203.2565564
VEGET	25 cropland	133.1070516
VEGET	25 permanent grassland	58.91652567
VEGET	25 shrubland	30.03891775
VEGET	25 forest	203.2565564
VEGET	50 cropland	142.4225072
VEGET	50 permanent grassland	59.7624414
VEGET	50 shrubland	21.20605033
VEGET	50 forest	201.9280525
PLANT	0 cropland	122.275267
PLANT	0 permanent grassland	53.30634424
PLANT	0 shrubland	46.48088382
PLANT	0 forest	203.2565564
PLANT	25 cropland	133.7615629
PLANT	25 permanent grassland	52.51889169
PLANT	25 shrubland	35.7820404
PLANT	25 forest	203.2565564
PLANT	50 cropland	150.5892856
PLANT	50 permanent grassland	46.58076915
PLANT	50 shrubland	24.89244026
PLANT	50 forest	203.2565564

### Data Figure 3. Greenhouse gas emissions

#### Europe

Scenario	Organic variant	Agriculture emissions (Mt CO <sub>2</sub> eq per year)	LUC emissions (Mt CO <sub>2</sub> per year)
REF		474	76
OAU	25%	472	135
OAU	50%	470	229
CIRC	No expansion	282	-2
CIRC	25%	302	23
CIRC	50%	359	90
DIV	No expansion	282	-2

DIV	25%	294	22
DIV	50%	320	85
VEGET	No expansion	259	-6
VEGET	25%	263	14
VEGET	50%	266	47
PLANT	0%	218	-18
PLANT	25%	211	16
PLANT	50%	207	65

## Rest of the World

Scenario	Organic variant	Agriculture emissions (Mt CO <sub>2</sub> eq per year)	LUC emissions (Mt CO <sub>2</sub> per year)
REF		6838	1284
OAU	25%	6844	1289
OAU	50%	6849	1277
CIRC	No expansion	6743	1157
CIRC	25%	6736	1128
CIRC	50%	6697	974
DIV	No expansion	6743	1157
DIV	25%	6745	1162
DIV	50%	6738	1117
VEGET	No expansion	6730	1140
VEGET	25%	6732	1145
VEGET	50%	6734	1144
PLANT	No expansion	6722	1134
PLANT	25%	6725	1143
PLANT	50%	6729	1141

## Global

Scenario	Organic variant	Agriculture emissions (Mt CO <sub>2</sub> eq per year)	LUC emissions (Mt CO <sub>2</sub> per year)
REF		7312	1360
OAU	25%	7316	1424
OAU	50%	7319	1505
CIRC	No expansion	7025	1156
CIRC	25%	7037	1150
CIRC	50%	7056	1065
DIV	No expansion	7025	1156
DIV	25%	7039	1184
DIV	50%	7058	1202
VEGET	No expansion	6989	1134
VEGET	25%	6995	1159
VEGET	50%	7000	1191
PLANT	No expansion	6940	1116
PLANT	25%	6936	1159
PLANT	50%	6935	1206