





















## Crop rotations (with legumes)

	Gross margin without measure (€/ha)			Implementation costs (€/ha)					Gross margin with measure (€/ha)			Change in gross margin (€/ha)			Change in gross margin (%)		
	Output (yield x price)	Operating costs	Gross margin	Investment	Operational	Displacement	Avoided	Net cost	High yield impact	Middle yield impact	Low yield impact	High yield impact	Middle yield impact	Low yield impact	High yield impact	Middle yield impact	Low yield impact
<b>Barley</b>																	
Denmark (winter)	1395	327	1068	0	0	0	-59	-59	1126	1126	1126	59	59	59	5	5	5
Denmark (spring)	1270	283	987	0	0	0	-48	-48	1034	1034	1034	48	48	48	5	5	5
Estonia	351	265	86	0	0	0	-34	-34	120	120	120	34	34	34	40	40	40
Finland	492	593	-101	0	0	0	-69	-69	-33	-33	-33	69	69	69	68	68	68
Germany	874	730	144	0	0	0	-64	-64	208	208	208	64	64	64	44	44	44
Greece	606	463	142	0	0	0	-64	-64	206	206	206	64	64	64	45	45	45
Hungary (winter)	502	411	91	0	0	0	-49	-49	140	140	140	49	49	49	54	54	54
Hungary (spring)	468	390	77	0	0	0	-31	-31	108	108	108	31	31	31	40	40	40
Ireland	1044	645	399	0	0	0	-86	-86	485	485	485	86	86	86	22	22	22
Italy	764	437	327	0	0	0	-33	-33	360	360	360	33	33	33	10	10	10
Lithuania	383	239	143	0	0	0	-35	-35	178	178	178	35	35	35	24	24	24
Poland	477	369	109	0	0	0	-54	-54	163	163	163	54	54	54	50	50	50
Spain	426	249	177	0	0	0	-35	-35	212	212	212	35	35	35	20	20	20
Spain (rainfed)	578	299	279	0	0	0	-57	-57	579	496	414	300	217	135	108	78	48
United Kingdom	1019	731	288	0	0	0	-80	-80	368	368	368	80	80	80	28	28	28
<b>Common wheat</b>																	
Denmark (winter)	1665	354	1311	0	0	0	-62	-62	1373	1373	1373	62	62	62	5	5	5
Denmark (spring)	1199	354	845	0	0	0	-62	-62	907	907	907	62	62	62	7	7	7
Bulgaria	518	268	250	0	0	0	-34	-34	284	284	284	34	34	34	14	14	14
Czech Republic	701	493	207	0	0	0	-46	-46	253	253	253	46	46	46	22	22	22
Estonia	379	321	59	0	0	0	-48	-48	107	107	107	48	48	48	82	82	82
Finland	544	702	-158	0	0	0	-81	-81	-77	-77	-77	81	81	81	51	51	51
France	1003	712	291	0	0	0	-94	-94	384	384	384	94	94	94	32	32	32
Germany	1148	728	420	0	0	0	-76	-76	496	496	496	76	76	76	18	18	18
Greece	512	407	106	0	0	0	-61	-61	166	166	166	61	61	61	57	57	57
Hungary	555	403	152	0	0	0	-43	-43	194	194	194	43	43	43	28	28	28
Hungary (winter)	581	428	153	0	0	0	-54	-54	207	207	207	54	54	54	35	35	35
Italy	1024	598	426	0	0	0	-52	-52	478	478	478	52	52	52	12	12	12
Latvia	531	432	99	0	0	0	-67	-67	166	166	166	67	67	67	68	68	68
Lithuania	591	392	198	0	0	0	-80	-80	279	279	279	80	80	80	40	40	40
Poland	734	489	245	0	0	0	-77	-77	322	322	322	77	77	77	31	31	31
Poland (winter)	2723	1014	1709	0	0	0	-226	-226	1935	1935	1935	226	226	226	13	13	13
Poland (spring)	2364	991	1373	0	0	0	-240	-240	1613	1613	1613	240	240	240	17	17	17
Romania	536	300	236	0	0	0	-28	-28	264	264	264	28	28	28	12	12	12
Spain	587	299	289	0	0	0	-38	-38	327	327	327	38	38	38	13	13	13
Spain (rainfed)	563	262	301	0	0	0	-44	-44	554	524	490	253	222	189	84	74	63
Spain (irrigated)	1028	453	574	0	0	0	-84	-84	658	658	658	84	84	84	15	15	15
Sweden	770	663	107	0	0	0	-91	-91	198	198	198	91	91	91	86	86	86
United Kingdom	1200	821	379	0	0	0	-84	-84	463	463	463	84	84	84	22	22	22
<b>Durum wheat</b>																	
France	996	776	220	0	0	0	-82	-82	302	302	302	82	82	82	37	37	37
Greece	429	438	-9	0	0	0	-56	-56	47	47	47	56	56	56	628	628	628
Italy	734	440	295	0	0	0	-44	-44	338	338	338	44	44	44	15	15	15
Spain	506	309	197	0	0	0	-33	-33	230	230	230	33	33	33	17	17	17
<b>Grain maize</b>																	
France	1425	1074	350	0	0	0	-123	-123	473	473	473	123	123	123	35	35	35
Germany	1577	1007	570	0	0	0	-100	-100	671	671	671	100	100	100	18	18	18
Greece	2029	1172	858	0	0	0	-140	-140	998	998	998	140	140	140	16	16	16
Hungary	917	615	301	0	0	0	-62	-62	363	363	363	62	62	62	20	20	20
Hungary (central region)	923	568	355	0	0	0	-36	-36	391	391	391	36	36	36	10	10	10
Italy	1712	926	786	0	0	0	-95	-95	882	882	882	95	95	95	12	12	12
Poland	959	549	410	0	0	0	-87	-87	497	497	497	87	87	87	21	21	21
Portugal	1629	1016	613	0	0	0	-108	-108	721	721	721	108	108	108	18	18	18
Romania	812	401	411	0	0	0	-34	-34	445	445	445	34	34	34	8	8	8
Slovakia	1012	776	236	0	0	0	-55	-55	291	291	291	55	55	55	23	23	23
Spain	1796	822	974	0	0	0	-93	-93	1067	1067	1067	93	93	93	10	10	10

## Co-benefits

Type of benefit	Size of effect				Type of effect
	Grassland legume-based	Grassland non-legume-based	Grain legumes	Lucerne	
Promote soil biodiversity					Increases soil carbon and in some cases nutrient content and improves soil structure. Adds more below-ground biomass and enhances microbial and earthworm activity for enhanced fertility and porosity of (deeper) soil layers.
Erosion protection					Elimination of continuous arable cropping improves soil structure and reduces periods of bare soil, decreasing erosion. Rotational cropping acts as a natural soil stabiliser by providing cover, especially if the soil is normally left bare.
Prevent nutrient leaching (N, P)					Rotational crop planting which avoids bare soils may enhance nutrient catching by crops and preventing nutrients from being lost to the soil or groundwater. Increased nutrient content from incorporating N-fixing crops may enhance leaching and run-off if more fertiliser is applied, but by decreasing the need for mineral fertiliser application, they can reduce excess run-off and leaching.
Reduce soil emissions (nitrous oxide and ammonia)					Depends on the crop regime. Certain crops, such as alfalfa, clover or rapeseed, absorb and store nitrogen in the soil.
Promote above ground biodiversity					Increases rate of humus production and reduces soil compaction. Diverse fauna can have positive effects on natural pest control and surface carbon availability.

**Legend:** ++ maximum positive effect, + positive effect, 0 no effect, - negative effect, -- maximum negative effect