SUPPLEMENTARY MATERIALS

Supplementary Table S1. Risk-of-Bias Decision Rules and Criteria

Domain	Low Risk of Bias	Moderate Risk of Bias / Some Concerns	High Risk of Bias
1. Experimental design	Factorial or split-plot randomized block design with appropriate intercropping layout and explicit control plots.	Non-randomized systematic design or simple block layout, but with clear and balanced spatial distribution.	Unbalanced layout, lack of proper control plots, or severe spatial confounding without design adjustment.
2. Replication	Adequate field replication with 3 or more true independent replicate plots per treatment.	Limited replication (2 true replicate plots) or pseudo-replication partially mitigated by statistical modeling.	No replication (n = 1) or unadjusted pseudo-replication (e.g., multiple samples taken from a single plot).
3. Baseline comparability	Baseline soil characteristics, olive tree age/density, and microclimatic conditions well-balanced across treatments.	Minor baseline differences reported or assumed, but controlled statistically or unlikely to confound results.	Major baseline imbalances in soil fertility, tree age, or slope between intercropped and monoculture plots.
4. Confounding control	Key confounding factors (fertilization, tillage, weed management, tree pruning) standardized across all treatments.	Minor variations in management between treatments, but documented and unlikely to bias main outputs.	Confounding co-interventions present (e.g., extra fertilizer or irrigation applied only to intercropped plots).
5. Study duration	Multi-year trial (3 or more consecutive growing seasons) capturing interannual climate variability.	Short-to-medium trial duration (2 consecutive growing seasons or multi-year with missing seasons).	Single-season evaluation (1 year/season), insufficient to capture olive alternate bearing or climate variation.
6. Outcome measurement	Objective, standardized, and fully described yield measurement methods (fresh mass, grain dry weight, biomass).	Standard measurement methods described with minor omissions in protocol or timing details.	Subjective, visual, or poorly defined yield estimations without standardized protocols.
7. Data completeness	Yield and biomass data fully reported for all established plots and treatment years (more than 95% complete).	Moderate missing data (5% to 15%) with valid explanation or appropriate handling/reporting.	High proportion of missing yield data (more than 15%) without explanation or selective omission of poor plots.
8. Selective reporting	All measured primary outcomes (olive yield, crop yield, biomass, LER metrics) fully reported.	Most expected yield outcomes reported, but secondary variables omitted without justification.	Clear evidence of selective reporting (e.g., reporting LER only for high-performing crops/years).
9. Other sources of bias	No other major methodological flaws, severe pest outbreaks, or edge/border effects identified.	Minor edge effects or localized pest damage noted, but evenly distributed or accounted for.	Major design flaws, severe localized crop failure unadjusted, or undisclosed commercial conflicts.

Table S2. Study-level overview of original yield data (numerators), monoculture baselines (denominators), and partial and total Land Equivalent Ratio (LER) values for olive-based intercropping systems.

study_ID	Year	Crop	DMY_AFS(kg/ha)	DMY_SCS(kg/ha)	GrainY_AFS(kg/ha)	GrainY_SCS(kg/ha)	DMY_RY(%)	GrainY_RY(%)	OLV_yield(t/ha)	RY_olive	LER_DMY	LER_GY
F. Temani et al., 2021	2017/18	durum wheat	1644	10356	1875	3359	15.90%	55.80%	7.3	99%	1.15	1.55
F. Temani et al., 2021	2017/18	faba bean	1491	2218	2039	4096	67.20%	49.80%	6.67	90%	1.57	1.4
F. Temani et al., 2021	2017/18	control	x	x	x	x	x	x	7.39	x	x	x
F. Temani et al., 2021	2017/18	durum wheat	2206	10013	1700	3657	22.00%	46.50%	7.84	94%	1.16	1.4
F. Temani et al., 2021	2017/18	faba bean	1791	3258	2182	4470	55.00%	48.80%	7.06	84%	1.39	1.33
F. Temani et al., 2021	2017/18	control	x	x	x	x	x	x	8.38	x	x	x
F. Temani et al., 2021	2017/18	durum wheat	2046	8144	2083	3993	25.10%	52.20%	7.53	88%	1.14	1.41
F. Temani et al., 2021	2017/18	faba bean	1378	2350	2248	4250	58.60%	52.90%	7.97	94%	1.52	1.46
F. Temani et al., 2021	2017/18	control	x	x	x	x	x	x	8.52	x	x	x
F. Temani et al., 2021	2018/19	durum wheat	1680	3609	351	1258	46.60%	27.90%	7.3	99%	1.45	1.27
F. Temani et al., 2021	2018/19	faba bean	477	726	290	408	65.70%	71.10%	6.67	90%	1.56	1.61

F. Temani et al., 2021	2018/19	control	x	x	x	x	x	x	7.39	x	x	x
F. Temani et al., 2021	2018/19	durum wheat	1353	3936	455	2137	34.40%	21.30%	7.53	102%	1.36	1.23
F. Temani et al., 2021	2018/19	faba bean	580	1000	417	384	58.00%	108.60%	7.97	108%	1.66	2.16
F. Temani et al., 2021	2018/19	control	x	x	x	x	x	x	8.52	x	x	x
F. Temani et al., 2021	2018/19	durum wheat	1286	3440	652	1844	37.40%	35.40%	7.84	106%	1.43	1.41
F. Temani et al., 2021	2018/19	faba bean	56.1	96.9	43.3	21.8	57.90%	198.60%	7.06	96%	1.53	2.94
F. Temani et al., 2021	2018/19	control	x	x	x	x	x	x	8.38	x	x	x
H. Benalia et al., 2024	2020/21	pea	838.99	1590.85	585	880	53%	66%	1.5	188%	2.4	2.54
H. Benalia et al., 2024	2021/22	pea	7805.47	3939.33	1630	1440	198%	113%	2.4	141%	3.39	2.54
H. Benalia et al., 2024	2020/21	barley	6671.275	4096.8	2045	860	163%	238%	1.2	150%	3.13	3.88
H. Benalia et al., 2024	2021/22	barley	17596.67	9695.83	5165	5950	181%	87%	1.7	100%	2.81	1.87
H. Benalia et al., 2024	2020/21	control	x	x	x	x	x	x	0.8	x	x	x
H. Benalia et al., 2024	2021/22	control	x	x	x	x	x	x	1.7	x	x	x

Panozzo, A.; Bernazeau, B. et al., 2020	2014/15	faba bean	x	x	x	x	x	x	0.8	160%	x	2.69
Panozzo, A.; Bernazeau, B. et al., 2020	2014/15	durum wheat	x	x	1.2	1.1	x	109%	0.8	160%	x	2.69
Panozzo, A.; Bernazeau, B. et al., 2020	2014/15	control	x	x	x	x	x	x	0.5	x	x	x
Panozzo, A.; Bernazeau, B. et al., 2020	2015/16	faba bean	x	x	x	x	x	x	0.8	80%	x	1.36
Panozzo, A.; Bernazeau, B. et al., 2020	2015/16	durum wheat	x	x	0.9	1.6	x	56%	0.8	80%	x	1.36
Panozzo, A.; Bernazeau, B. et al., 2020	2015/16	control	x	x	x	x	x	x	1	x	x	x
Panozzo, A.; Bernazeau, B. et al., 2020	2016/17	faba bean	x	x	x	x	x	x	4.1	141%	x	1.85
Panozzo, A.; Bernazeau, B. et al., 2020	2016/17	durum wheat	x	x	1	2.3	x	43%	4.1	141%	x	1.85
Panozzo, A.; Bernazeau, B. et al., 2020	2016/17	control	x	x	x	x	x	x	2.9	x	x	x
Amassaghrou, A.; Barkaoui, K. et al., 2023	2015/16	faba bean	2,757.00	x	700	1000	33%	70%	5.9	75.00%	1.08	1.45
Amassaghrou, A.; Barkaoui, K. et al., 2023	2016/17	faba bean	3,797.00	x	900	1400	33%	64%	5.9	56.00%	0.89	1.2
Amassaghrou, A.; Barkaoui, K. et al., 2023	2015/16	lentil	3,472.33	x	400	500	33%	80%	5.5	70.00%	1.03	1.5
Amassaghrou, A.; Barkaoui, K. et al., 2023	2016/17	lentil	1,009.67	x	400	600	33%	67%	5.5	52.00%	0.85	1.19

Amassaghrou, A.; Barkaoui, K. et al., 2023	2015/16	durum wheat	4,844.33	x	1300	2000	47%	65%	4	46.00%	0.93	1.11
Amassaghrou, A.; Barkaoui, K. et al., 2023	2016/17	durum wheat	1,960.67	x	1200	2100	47%	57%	4	42.00%	0.89	0.99
Amassaghrou, A.; Barkaoui, K. et al., 2023	2015/16	soft wheat	3,944.33	x	1500	1300	47%	115%	4.5	46.00%	0.93	1.61
Amassaghrou, A.; Barkaoui, K. et al., 2023	2016/17	soft wheat	2,189.33	x	1400	2500	47%	56%	4.5	53.00%	1	1.09
Amassaghrou, A.; Barkaoui, K. et al., 2023	2015/16	barley	3,748.67	x	1400	2100	47%	67%	5.1	60.00%	1.07	1.27
Amassaghrou, A.; Barkaoui, K. et al., 2023	2016/17	barley	2,393.67	x	1100	2500	47%	44%	5.1	52.00%	0.99	0.96
Amassaghrou, A.; Barkaoui, K. et al., 2023	2015/16	control	x	x	x	x	x	x	9.2	x	x	x
Amassaghrou, A.; Barkaoui, K. et al., 2023	2016/17	control	x	x	x	x	x	x	9.2	x	x	x
Tziolas, E et al., 2022	2014	barley	x	x	2000	2500	x	80%	0.2	5.62%	x	0.86
Tziolas, E et al., 2022	2015	barley	x	x	2000	2500	x	80%	0.2	5.62%	x	0.86
Tziolas, E et al., 2022	2016	barley	x	x	2000	2500	x	80%	0.2	5.62%	x	0.86
Tziolas, E et al., 2022	2014	control	x	x	x	x	x	x	3.56	x	x	x
Tziolas, E et al., 2022	2015	control	x	x	x	x	x	x	3.56	x	x	x
Tziolas, E et al., 2022	2016	control	x	x	x	x	x	x	3.56	x	x	x
Abidi, I. et al., 2024	2021	quinoa varP	2400	2300	1100	1000	104%	110.00%	4.01	88%	1.92	1.98
Abidi, I. et al., 2024	2021	quinoa varP	2500	4300	1200	1700	58%	70.60%	6.95	153%	2.11	2.23

Abidi, I. et al., 2024	2021	quinoa varT	2000	2400	900	1000	83%	90.00%	4.72	104%	1.87	1.94
Abidi, I. et al., 2024	2021	quinoa varT	2600	8700	1100	3500	30%	31.40%	4.77	105%	1.35	1.36
Abidi, I. et al., 2024	2021	quinoa varQ5	2200	5300	900	2100	42%	42.90%	5.49	121%	1.62	1.64
Abidi, I. et al., 2024	2021	quinoa varQ5	2400	6100	1000	2400	39%	41.70%	5.51	121%	1.6	1.63
Abidi, I. et al., 2024	2021	quinoa varQ4	1900	3200	800	1400	59%	57.10%	4.82	106%	1.65	1.63
Abidi, I. et al., 2024	2021	quinoa varQ4	2700	4600	1100	1700	59%	64.70%	7.82	172%	2.31	2.37
Abidi, I. et al., 2024	2021	control	x	x	x	x	x	x	4.55	x	x	x
Abidi, I. et al., 2024	2021	control	x	x	x	x	x	x	6.36	x	x	x