

Ioannidou et al. Supplementary material

Table S1. Characteristics and attributes of the selected mixed orchards (location, system, main tree species, area, and tree age).

a/a	Location name	Code	System (Org=B or Con=C)	Main tree crop	Area (ha)	Tree age (years)
1	A. Varvara	ALB1	B	Almonds	0.8	15
2	Lythrodontas	PLB2	B	Plums	0.542	13
3	Lythrodontas	PISC3	C	Pistachios	0.284	22
4	Korakou	PLB4	B	Plums	0.45	5
5	Korakou	APRC5	C	Appricots	0.17	10
6	Temvria	PLB6	B	Plums	0.38	10
7	Galata- Temvria	PLC7	C	Plums	0.44	20
8	Vavla	NUB10	B	Nuts	1.03	18
9	Louvaras	CHB11	B	Cherry	0.39	10
10	Limnatis	PLB13	B	Plums	0.23	6
11	Limnatis	ALB14	B	Almonds	0.51	25
12	Limnatis	ALC15	C	Almonds	0.84	25
13	Limnatis	ALC16	C	Almonds	1.33	40
14	Vavla	ALC17	C	Almonds	0.76	25
15	Peristerona	PLB18	B	Plums	0.488	12
16	Peristerona	PLC19	C	Plums	0.33	10
17	Koutrafas	PLB20	B	Plums	0.641	10
18	Koutrafas	APRC21	C	Appricots	0.652	20
19	A. Ioannis Maloundas	APRB22	B	Appricots	0.95	7
20	A. Ioannis Maloundas	NUC23	C	Nuts	0.3	20
21	Dymes	PLB26	B	Plums	0.384	20
22	Dymes	ALC27	C	Almonds	0.107	20
23	Athiainou	ALB30	B	Almonds	1.41	4
24	Athiainou	ALC31	C	Almonds	0.46	10
25	Athiainou	ALB32	B	Almonds	0.8	13
26	Athiainou	ALC33	C	Almonds	1.67	15
27	Lythrodontas	PEB34	B	Peach	0.35	8
28	Lythrodontas	NUC35	C	Nuts	0.48	20
29	Mosfiloti	PEC37	C	Peach	0.5	10
30	Trouloi	NUB38	B	Nuts Almonds	0.443	15
31	M. Machaira	PEB40	B	Appricots	0.84	5
32	Machairas	NUC41	C	Nuts	0.578	20
33	Kapedes	CHB42	B	Cherry	0.98	7
34	Kapedes	NUC43	C	Nuts	0.312	15
35	Kampia	PEC44	C	Peach	0.39	10
36	Mesa Chorio	PEB46	B	Peach	0.71	6
37	Amargeti	PLB48	B	Plums	0.409	7
38	Amargeti	NUC49	C	Nuts	0.62	15
39	Panagia	PLC53	C	Plums	0.364	4

Table S2. Soil parameters.

	Soil respiration (CO ₂ mg/100g /24h/25°C)	Org N (%)	MWD (mm)	Org matter (%)	Number of weed species	AMF(%)
Stone fruits						
PLB2	54	0.135	14	0.94	9	32
PLB4	29	0.198	11	1.36	6	22
APRC5	19	0.111	8	0.87	5	12
PLB6	36	0.156	13	1.12	7	32
PLC7	20	0.121	12	0.89	5	12
CHB11	38	0.165	13	1.32	8	32
PLB13	36	0.165	12	1.21	8	32
PLB18	39	0.145	12	1.11	10	41
PLC19	25	0.124	9	0.95	4	24
PLB20	45	0.135	12	0.99	9	29
APRC21	25	0.148	10	1.11	3	27
APRB22	41	0.178	13	1.32	5	28
PLB26	29	0.165	13	1.22	10	36
PEB34	29	0.168	14	1.23	5	31
PEC37	17	0.123	10	0.87	1	16
PEB40	37	0.165	13	1.19	7	33
CHB42	32	0.145	11	1.21	6	29
PEC44	17	0.094	10	0.68	4	26
PEB46	34	0.142	12	1.1	5	43
PLB48	32	0.132	13	0.95	5	32
PLC53	19	0.109	9	0.86	1	11
Nuts						
ALB1	38	0.185	12	1.31	6	37
PISC3	18	0.108	9	0.82	4	14
NUB10	33	0.145	12	1.03	7	19
ALB14	29	0.124	12	0.92	5	28
ALC15	17	0.119	7	0.87	2	20
ALC16	18	0.125	8	0.92	3	17
ALC17	22	0.131	8	0.99	3	23
NUC23	22	0.132	10	0.99	3	24
ALC27	23	0.101	10	1.17	6	17
ALB30	56	0.135	13	0.99	7	25
ALC31	23	0.121	9	0.84	4	12
ALB32	29	0.156	12	1.15	5	23
ALC33	19	0.112	7	0.87	3	18
NUC35	19	0.121	9	0.87	3	19
NUB38	36	0.174	12	1.35	4	28
NUC41	24	0.132	9	0.98	3	19
NUC43	17	0.098	7	0.75	3	24
NUC49	24	0.108	12	0.82	2	21

Table S3. Emission factors for diesel and fertilizer production.

Input	GHG emissions	Source
Diesel burned in machinery	3.8 kg CO ₂ -eq/L	Ecoinvent v3.8
Manure (sheep & goat)	0.147 kg CO ₂ -eq/kg product	Ecoinvent v3.8
Organic fertilizer (5-5-10)	0.675 kg CO ₂ -eq/kg product	Ecoinvent v3.8
Mineral N fertilizer	1.568 kg CO ₂ -eq/kg N	Ecoinvent v3.8

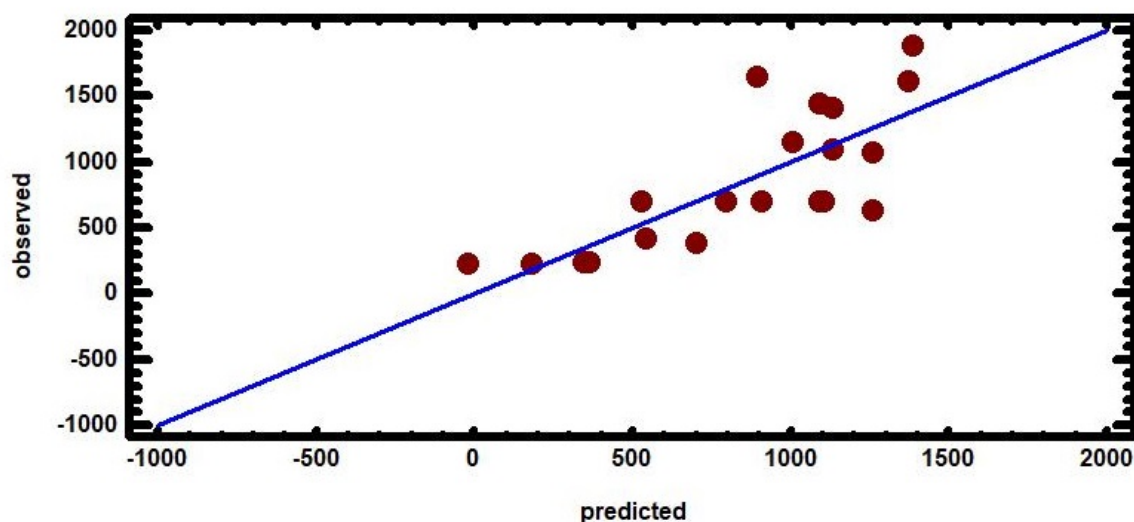


Figure S1. Plot of observed vs. predicted GHG emissions for the case of organic and conventional mixed stone fruit orchards.

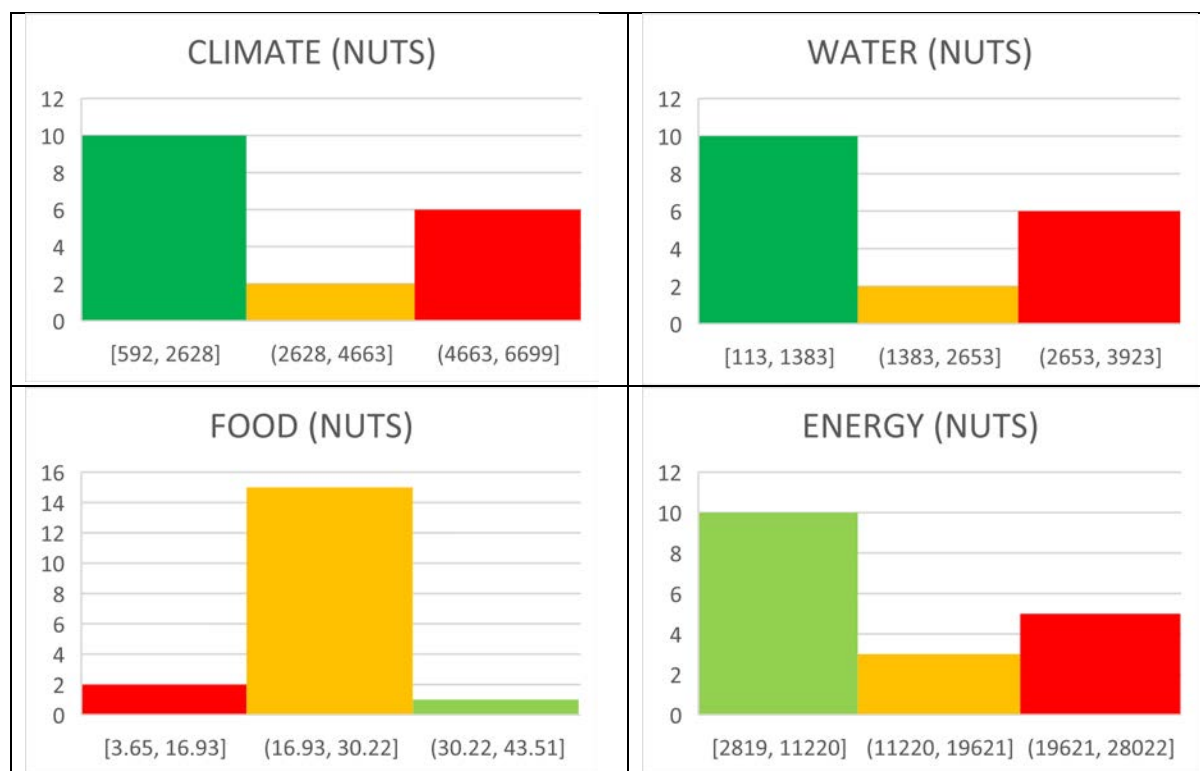


Figure S2. Classes obtained based on the values of the WEFC parameters for the mixed nut orchards. Green: 3 points; orange: 1 point; red: 0 points.

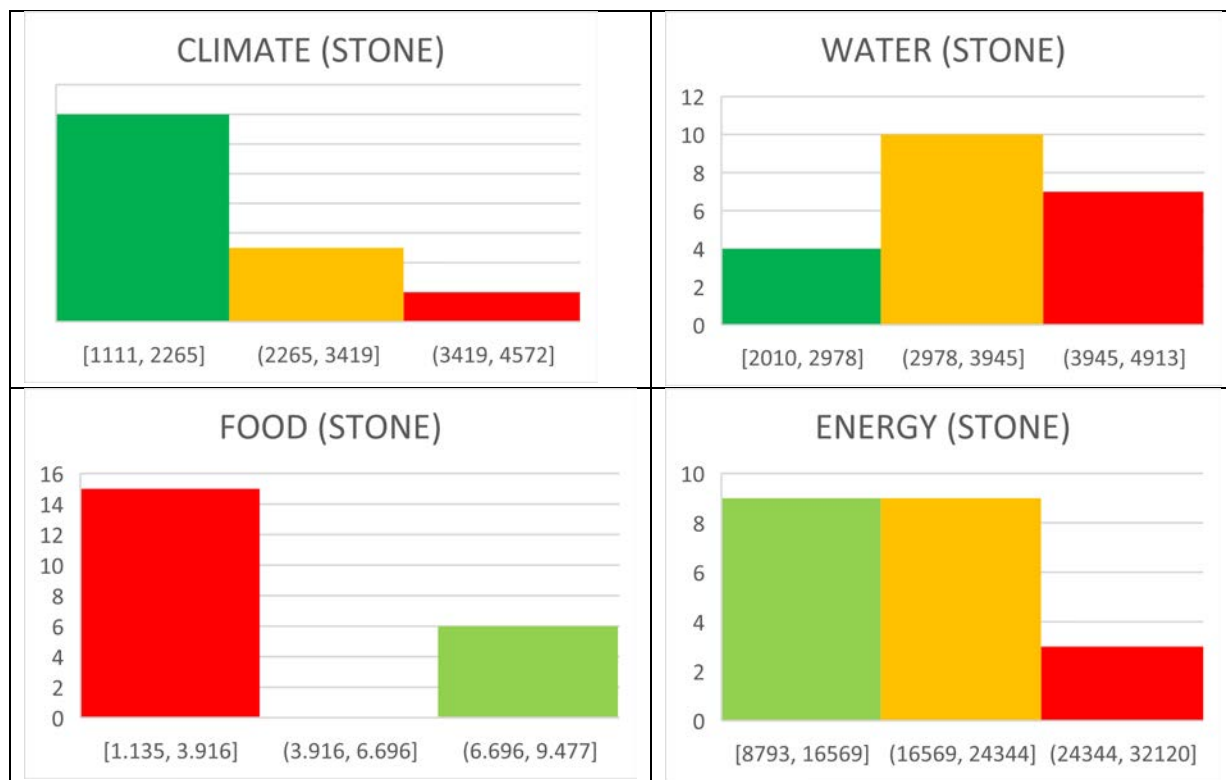


Figure S3. Classes obtained based on the values of the WEFC parameters for the mixed stone fruit orchards. Green: 3 points; orange: 1 point; red: 0 points.

Table S4. WEFC parameters for the mixed orchards and ES-related classification.

Location	Code	Sys- tem	GHG (kgCO ₂ eq/ha)	WATER (m ³ /ha)	FOOD (Mcal/ha)	ENERGY (MJ/ha)
A. Varvara	ALB1	B	928	658	3.65	3708
Lythrodontas	PISC3	C	4059	2685	19.33	16474
Vavla	NUB10	B	3164	1418	22.10	12726
Limnatis	ALB14	B	928	658	18.23	3708
Limnatis	ALC15	C	803	113	22.71	3472
Limnatis	ALC16	C	803	113	22.71	3472
Vavla	ALC17	C	803	113	22.71	3472
A. Ioannis Maloun- das	NUC23	C	6699	3923	26.00	28022
Dymes	ALC27	C	803	113	22.71	3472
Athiainou	ALB30	B	592	261	6.08	2819
Athiainou	ALC31	C	803	113	22.71	3472
Athiainou	ALB32	B	928	658	18.23	3708
Athiainou	ALC33	C	803	113	22.71	3472
Lythrodontas	NUC35	C	6699	3923	26.00	28022
Trouloi	NUB38	B	4701	1839	43.51	19395
Machairas	NUC41	C	6699	3923	26.00	28022
Kapedes	NUC43	C	6699	3923	26.00	28022
Amargeti	NUC49	C	6699	3923	26.00	28022
Lythrodontas	PLB2	B	1918	3015	2.724	17461
Korakou	PLB4	B	1302	2010	1.135	12395
Korakou	APRC5	C	2139	3500	9.477	14163
Temvria	PLB6	B	1918	3015	2.724	17461
Galata- Temvria	PLC7	C	2106	4178	8.626	13156
Louvaras	CHB11	B	4572	4268	3.170	32120
Limnatis	PLB13	B	1488	2010	1.362	13934
Peristerona	PLB18	B	1918	3015	2.724	17461
Peristerona	PLC19	C	2106	4178	8.626	13156
Koutrafas	PLB20	B	1918	3015	2.724	17461
Koutrafas	APRC2 1	C	2139	3500	9.477	14163
A. Ioannis Maloun- das	APRB2 2	B	1566	4913	2.452	10047
Dymes	PLB26	B	1918	3015	2.724	17461
M. Machaira	PEB34	B	2687	3135	1.428	25348
Mosfiloti	PEC37	C	3282	4200	7.880	22763
M. Machaira	PEB40	B	2302	2090	1.428	21884
Kapedes	CHB42	B	3650	4268	2.219	28008
Kampia	PEC44	C	3282	4200	7.880	22763
Mesa Chorio	PEB46	B	2508	3135	1.773	23743
Amargeti	PLB48	B	1706	3015	1.589	15924
Panagia	PLC53	C	1111	2785	2.875	8793