Supplemental Data

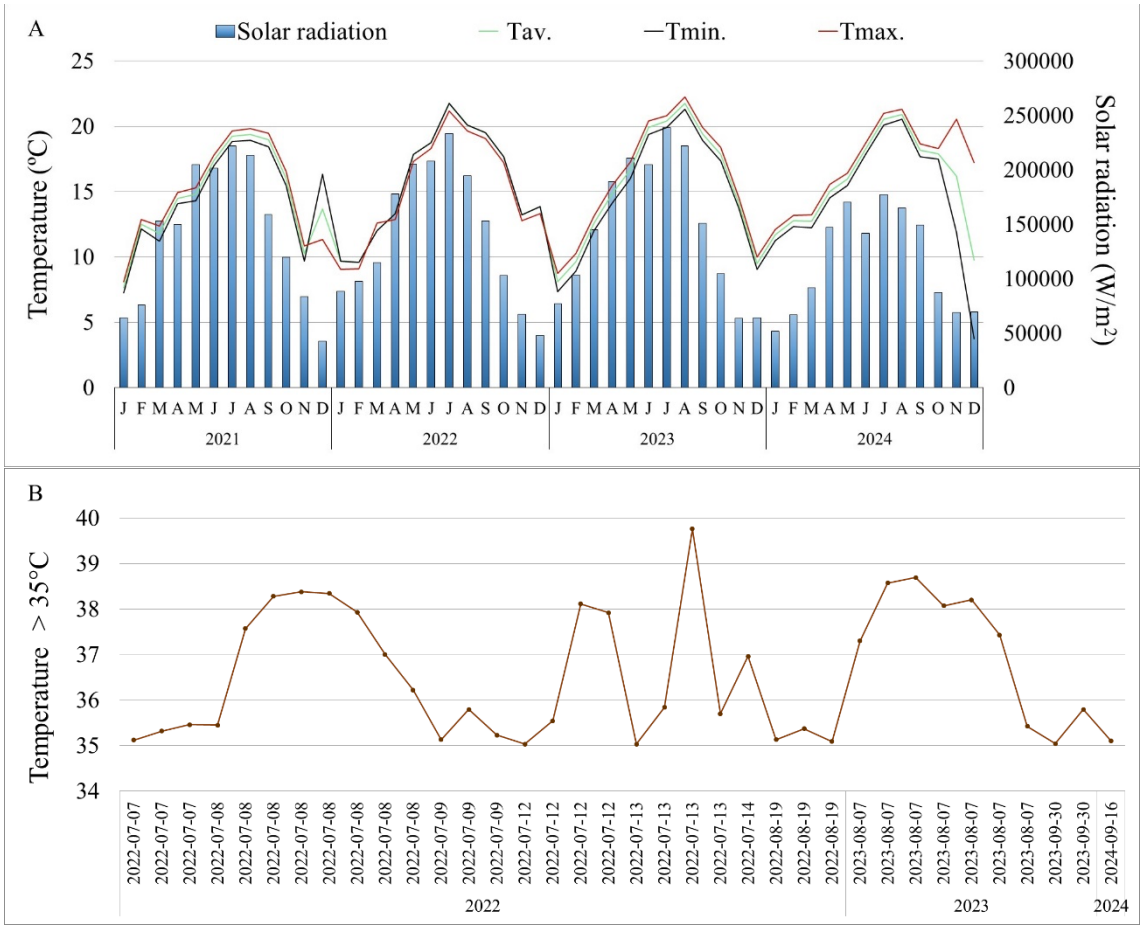


Figure S1. A) Monthly averages of mean (Tav.), minimum (Tmin.), and maximum (Tmax.) air temperatures, and accumulated solar radiation, recorded between January 2021 and December 2024. B) Number of days per month with maximum temperatures above 35 °C recorded during the same period.

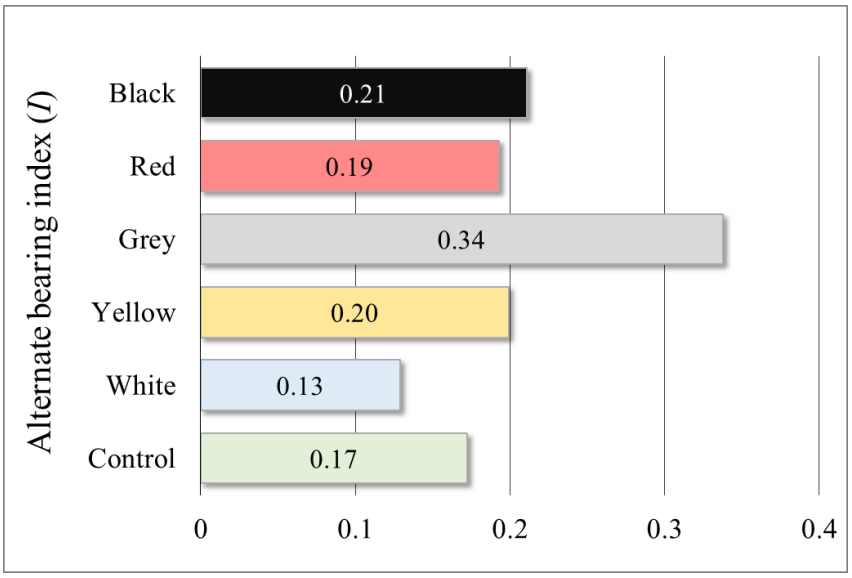


Figure S2. Alternate bearing index (*I*) of apple trees of the 'Gala Redlum' cultivar for the harvest of 2020 to 2024, as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%) and for apple trees without net cover (control).

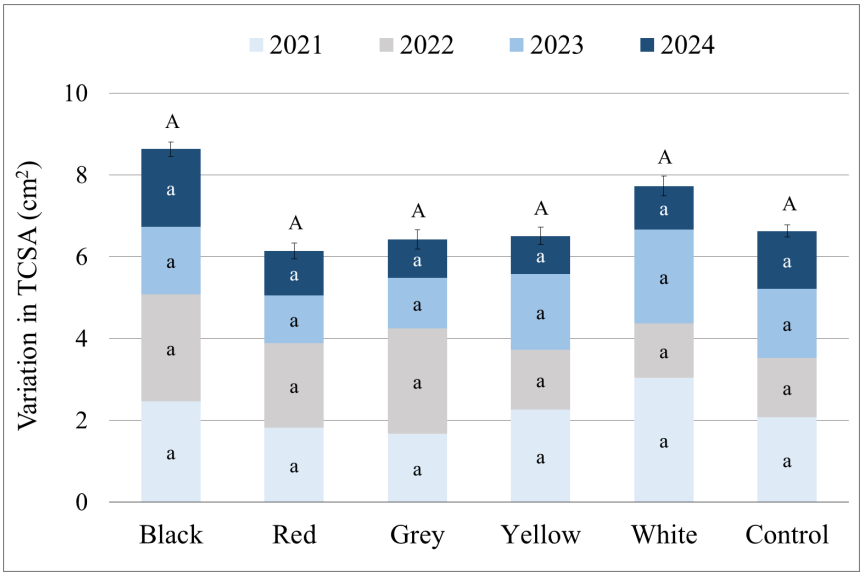


Figure S3. Cumulative variation on trunk cross-sectional area (TCSA) of apple trees of the 'Gala Redlum' cultivar (mean ± standard error) taken in each year (2021-2024) as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control). Means followed by the same letters within each year and between net cover modality (lowercase) and within each modality for cumulative variation (uppercase) are not significantly different.

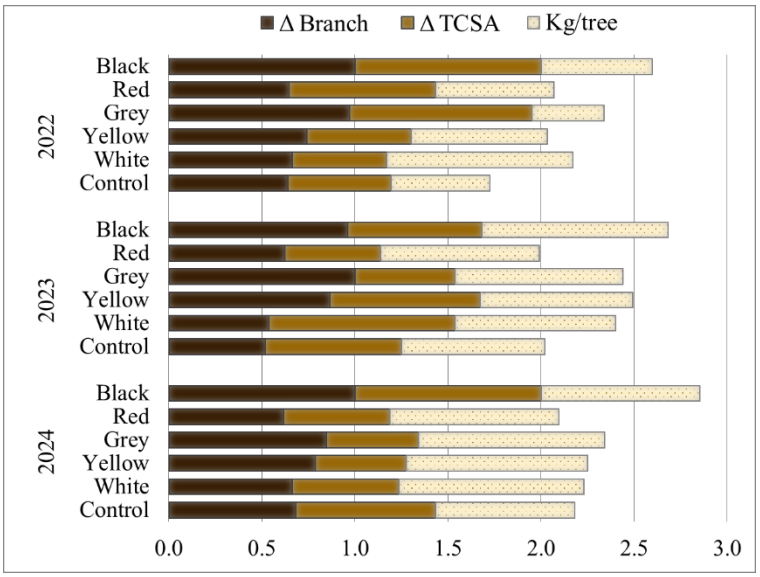


Figure S4. Normalization of average annual branch growth (Δ Branch), annual variation in trunk cross-sectional area (Δ TCSA), and yield per tree (kg/tree) of apple trees of the 'Gala Redlum' cultivar, relative to the net cover modality that exhibited the highest values for each parameter. The net cover modalities included different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control).

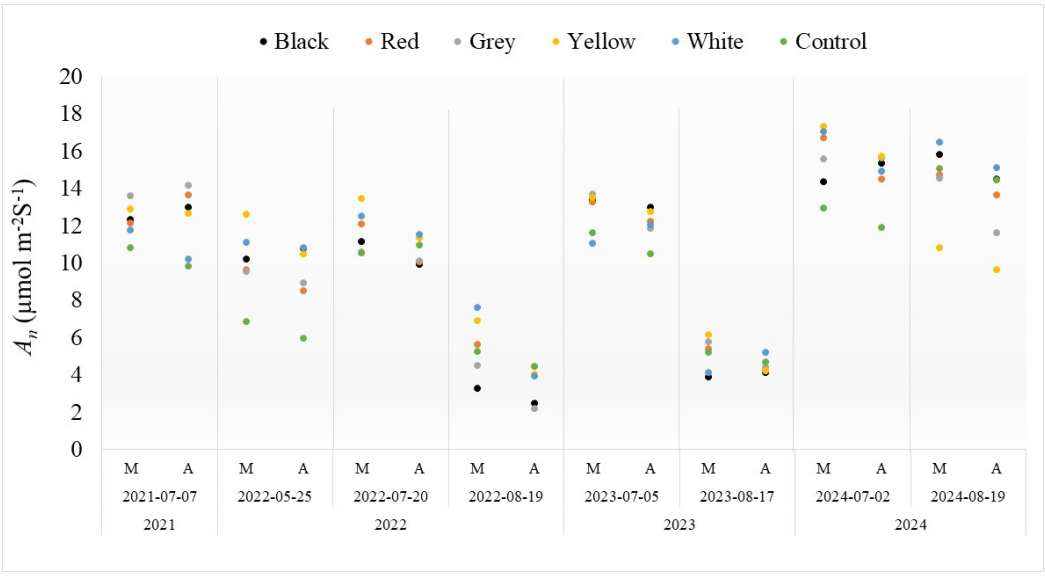


Figure S5. Average photosynthetic rate (A_n) of apple trees of the 'Gala Redlum' cultivar, between periods (morning – M; and afternoon – A) and years (2021 to 2024), as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control).

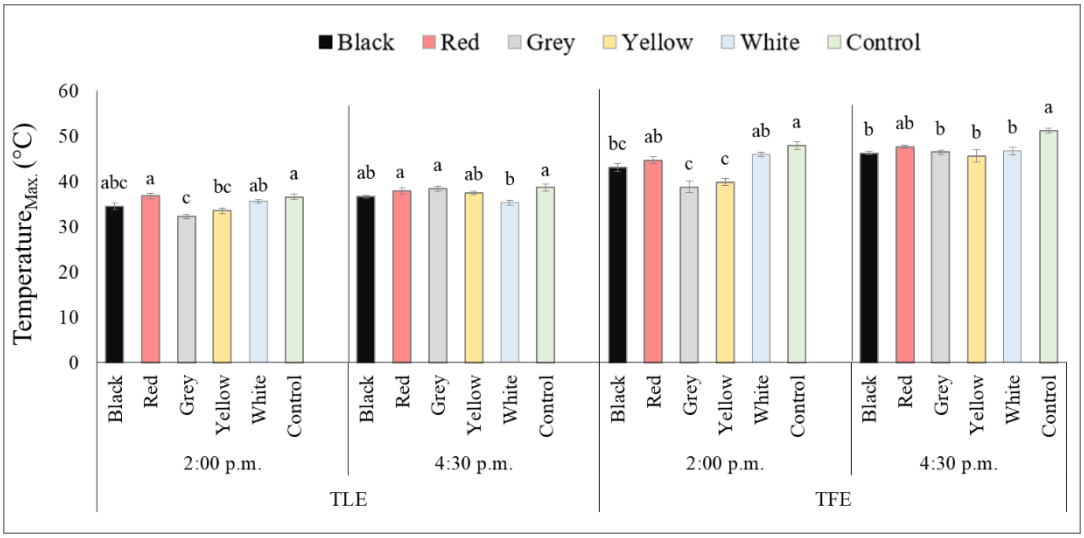


Figure S6. Temperatures registered on leaves and fruits of the 'Gala Redlum' cultivar (mean ± standard error), located on the exterior of the canopy (TLE and TFE), at different times (2:00 and 4:30 p.m.) in 2024, as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control). Means followed by different letters within each year and between net cover modalities are significantly different (TFE at 2:00 p.m. by Games-Howell test; TLE at 11:30 p.m. and TFE at 4:30 p.m. by Dunn's test; remaining significant cases by Tukey's test; $p \leq 0.05$).

Table S1. Biometric data of apple trees of the 'Gala Redlum' cultivar (mean ± standard error) taken in each year (2021-2024) as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control). Means followed by different letters within each year and between net cover modalities are significantly different ($TCSA_{initial}$ in 2021 and variation of height in 2024 by Dunn's test; remaining significant cases by Tukey's test; $p \leq 0.05$).

Year	Modality	$TCSA_{initial}$ (cm^2)		$TCSA_{final}$ (cm^2)		Δ TCSA (cm^2)		RGR (cm^2/days)		Δ Height (m)		Δ Volumetry (m^3)	
2021	Black	6.53 ± 0.29	ab	8.85 ± 0.66	ab	2.46 ± 0.42	a	0.0026 ± 0.0004	a	0.27 ± 0.07	a	0.53 ± 0.17	a
	Red	5.15 ± 0.38	b	6.98 ± 0.57	b	1.83 ± 0.26	a	0.0024 ± 0.0003	a	0.29 ± 0.06	a	0.23 ± 0.07	a
	Grey	8.48 ± 0.82	a	10.16 ± 0.92	a	1.67 ± 0.49	a	0.0014 ± 0.0004	a	0.14 ± 0.04	a	0.32 ± 0.10	a
	Yellow	6.00 ± 0.91	b	8.27 ± 0.89	ab	2.26 ± 0.28	a	0.0029 ± 0.0006	a	0.11 ± 0.04	a	0.40 ± 0.08	a
	White	5.51 ± 0.39	b	8.55 ± 0.57	ab	3.04 ± 0.58	a	0.0040 ± 0.0009	a	0.16 ± 0.06	a	0.42 ± 0.10	a
	Control	5.15 ± 0.31	b	7.24 ± 0.61	ab	2.08 ± 0.32	a	0.0027 ± 0.0003	a	0.17 ± 0.04	a	0.55 ± 0.08	a
2022	Black	9.28 ± 0.72	a	11.90 ± 0.94	a	2.62 ± 0.39	a	0.0012 ± 0.0002	a	0.55 ± 0.12	a	1.34 ± 0.20	a
	Red	7.47 ± 0.68	a	9.53 ± 1.17	a	2.06 ± 0.57	a	0.0011 ± 0.0002	a	0.38 ± 0.10	a	0.95 ± 0.19	ab
	Grey	10.87 ± 1.12	a	13.44 ± 1.47	a	2.57 ± 0.53	a	0.0010 ± 0.0002	a	0.30 ± 0.03	a	0.82 ± 0.13	ab
	Yellow	8.40 ± 1.11	a	9.86 ± 1.40	a	1.47 ± 0.65	a	0.0008 ± 0.0003	a	0.34 ± 0.05	a	0.55 ± 0.09	b
	White	8.55 ± 0.78	a	9.88 ± 0.94	a	1.33 ± 0.18	a	0.0007 ± 0.0001	a	0.28 ± 0.05	a	1.05 ± 0.14	ab
	Control	7.76 ± 0.68	a	9.21 ± 0.85	a	1.45 ± 0.24	a	0.0008 ± 0.0001	a	0.23 ± 0.06	a	0.73 ± 0.19	ab
2023	Black	11.71 ± 0.86	a	13.37 ± 0.98	a	1.66 ± 0.26	a	0.0006 ± 0.0001	ab	0.35 ± 0.05	a	1.32 ± 0.23	ab
	Red	9.68 ± 1.35	a	10.86 ± 1.35	a	1.18 ± 0.22	a	0.0006 ± 0.0001	ab	0.33 ± 0.10	a	0.96 ± 0.19	ab
	Grey	13.43 ± 1.31	a	14.67 ± 1.53	a	1.24 ± 0.25	a	0.0004 ± 0.0001	b	0.32 ± 0.10	a	1.44 ± 0.28	a
	Yellow	10.46 ± 1.47	a	12.31 ± 1.36	a	1.86 ± 0.32	a	0.0009 ± 0.0002	ab	0.33 ± 0.07	a	1.36 ± 0.19	ab
	White	9.54 ± 0.99	a	11.83 ± 1.02	a	2.30 ± 0.28	a	0.0011 ± 0.0002	a	0.07 ± 0.04	a	0.53 ± 0.22	ab
	Control	9.70 ± 1.04	a	11.38 ± 1.06	a	1.68 ± 0.31	a	0.0008 ± 0.0002	ab	0.13 ± 0.05	a	0.50 ± 0.15	b
2024	Black	13.43 ± 0.94	a	15.33 ± 0.97	a	1.89 ± 0.24	a	0.0006 ± 0.0001	a	0.26±0.04	ab	1.22±0.14	a
	Red	11.28 ± 1.40	a	12.36 ± 1.58	a	1.08 ± 0.28	a	0.0004 ± 0.0001	a	0.14±0.04	b	1.28±0.21	a
	Grey	15.29 ± 1.73	a	16.23 ± 1.77	a	0.94 ± 0.37	a	0.0003 ± 0.0001	a	0.22±0.05	ab	1.10±0.14	a
	Yellow	12.07 ± 1.30	a	13.00 ± 1.35	a	0.93 ± 0.18	a	0.0003 ± 0.0001	a	0.08±0.12	b	0.72±0.05	a
	White	11.72 ± 1.14	a	12.81 ± 1.30	a	1.09 ± 0.24	a	0.0004 ± 0.0001	a	0.09±0.06	b	0.66±0.14	a
	Control	11.00 ± 0.96	a	12.42 ± 1.12	a	1.42 ± 0.27	a	0.0005 ± 0.0001	a	0.34±0.04	a	1.12±0.19	a

TCSA – Trunk cross-sectional area; RGR – relative growth rate of TCSA.

Table S2. Biometric data on annual branch growth (cm) of apple trees of the 'Gala Redlum' cultivar (mean ± standard error) taken in each year (2022-2024) as a function of the net cover modalities with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control). Means followed by different letters within each year and between net cover modalities are significantly different ($Branch_{initial}$ in 2022, by Games-Howell test; remaining significant cases by Tukey's test; $p \leq 0.05$).

Year	Modality	$Branch_{initial}$		$Branch_{final}$		Δ Branch	
2022	Black	1411 ± 104	a	4772 ± 451	a	3361 ± 521	a
	Red	1110 ± 79	ab	3288 ± 521	a	2178 ± 540	a
	Grey	1248 ± 48	a	4510 ± 420	a	3262 ± 424	a
	Yellow	1240 ± 129	ab	3740 ± 434	a	2500 ± 366	a
	White	1117 ± 120	ab	3343 ± 495	a	2226 ± 497	a
	Control	862 ± 45	b	3016 ± 255	a	2154 ± 269	a
2023	Black	1629 ± 186	a	4797 ± 453	a	3168 ± 311	ab
	Red	1211 ± 157	a	3269 ± 511	ab	2059 ± 394	abc
	Grey	1316 ± 118	a	4611 ± 364	ab	3295 ± 341	a
	Yellow	1203 ± 83	a	4057 ± 445	ab	2855 ± 395	abc
	White	1219 ± 71	a	2998 ± 329	b	1779 ± 268	bc
	Control	1204 ± 49	a	2916 ± 202	b	1712 ± 224	c
2024	Black	1880±183	ab	5136±287	a	3256±322	a
	Red	1585±190	ab	3591±646	a	2007±483	a
	Grey	2090±146	a	4844±391	a	2754±250	a
	Yellow	1790±93	ab	4357±256	a	2567±266	a
	White	1296±73	b	3459±355	a	2163±365	a
	Control	1301±126	b	3526±315	a	2225±234	a

Table S3. Physiological parameters of apple leaves of the 'Gala Redlum' cultivar (mean ± standard error) taken in the morning period for each date and between years (2020-2024), as a function of the net cover modalities with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control). Means followed by different letters within each date and year and between net cover modalities are significantly different [A_n in 2020, gs in 2021, Ci in 2020 (21 Sep) and 2023, E in 2020 (19 Aug), by Dunn's test; remaining significant cases by Tukey's test; $p \leq 0.05$].

Year	Date	Modality	A_n (μmol m^{-2} s^{-1})		gs (mol m^{-2} s^{-1})		Ci (vpm)		E (μmol m^{2} s^{-1})	
2020	2020-07-14	Black	7.91 ± 1.08	a	0.16 ± 0.04	ab	270 ± 7.65	b	4.22 ± 0.49	ab
		Red	7.82 ± 1.53	a	0.14 ± 0.03	ab	268 ± 7.30	b	3.97 ± 0.50	b
		Grey	9.19 ± 1.65	a	0.19 ± 0.03	ab	279 ± 7.86	ab	4.45 ± 0.44	ab
		Yellow	6.74 ± 1.48	ab	0.13 ± 0.03	ab	268 ± 6.28	b	3.57 ± 0.29	b
		White	8.32 ± 1.12	a	0.25 ± 0.04	a	304 ± 6.37	a	6.05 ± 0.34	a
		Control	3.69 ± 0.58	b	0.09 ± 0.02	b	297 ± 8.48	ab	3.45 ± 0.42	b
	2020-07-21	Black	15.6 ± 1.14	abc	0.27 ± 0.02	ab	249 ± 4.42	b	2.41 ± 0.16	a
		Red	15.1 ± 0.72	bc	0.24 ± 0.03	b	241 ± 12.2	b	2.17 ± 0.17	a
		Grey	15.9 ± 0.43	ab	0.28 ± 0.02	ab	282 ± 8.46	a	2.63 ± 0.13	a
		Yellow	13.8 ± 0.51	c	0.23 ± 0.03	b	262 ± 5.67	ab	2.28 ± 0.12	a
		White	17.7 ± 0.36	a	0.35 ± 0.02	a	257 ± 4.14	ab	2.65 ± 0.03	a
		Control	14.9 ± 0.14	bc	0.24 ± 0.02	b	241 ± 10.7	b	2.42 ± 0.13	a
	2020-08-19	Black	11.4 ± 1.76	a	0.21 ± 0.04	ab	263 ± 4.74	a	2.46 ± 0.23	ab
		Red	10.1 ± 1.59	a	0.16 ± 0.03	ab	256 ± 11.4	a	2.27 ± 0.24	ab
		Grey	10.6 ± 1.73	a	0.21 ± 0.04	ab	274 ± 3.81	a	2.45 ± 0.24	ab
		Yellow	9.1 ± 1.58	a	0.15 ± 0.02	b	260 ± 7.20	a	2.09 ± 0.16	b
		White	15.8 ± 1.04	a	0.29 ± 0.02	a	252 ± 10.7	a	3.15 ± 0.07	a
		Control	12.5 ± 1.35	a	0.23 ± 0.04	ab	252 ± 7.53	a	2.90 ± 0.24	ab
2021	2021-06-09	Black	10.5 ± 0.88	ab	0.17 ± 0.01	ab	253 ± 8.66	a	2.61 ± 0.12	a
		Red	10.7 ± 0.47	ab	0.19 ± 0.01	a	262 ± 8.46	a	2.79 ± 0.05	a
		Grey	11.3 ± 1.34	a	0.20 ± 0.03	a	264 ± 5.19	a	2.85 ± 0.18	a
		Yellow	11.6 ± 1.04	a	0.17 ± 0.01	a	244 ± 7.00	a	2.75 ± 0.06	a
		White	8.32 ± 0.73	ab	0.13 ± 0.01	b	257 ± 6.80	a	2.43 ± 0.08	a
		Control	7.17 ± 0.51	b	0.13 ± 0.02	b	265 ± 14.2	a	2.40 ± 0.27	a
	2021-07-07	Black	12.3 ± 0.44	a	0.20 ± 0.02	a	249 ± 7.72	a	2.90 ± 0.08	a
		Red	12.1 ± 1.14	a	0.19 ± 0.02	a	246 ± 5.70	a	2.85 ± 0.09	a
		Grey	13.6 ± 0.67	a	0.23 ± 0.02	a	250 ± 3.30	a	3.13 ± 0.12	a
		Yellow	12.9 ± 0.66	a	0.20 ± 0.02	a	242 ± 5.79	a	3.07 ± 0.14	a
		White	11.8 ± 0.75	a	0.19 ± 0.01	a	250 ± 7.90	a	2.94 ± 0.14	a
		Control	10.8 ± 0.74	a	0.17 ± 0.02	a	253 ± 4.09	a	2.94 ± 0.15	a
2022	2022-05-25	Black	10.2 ± 1.26	ab	0.16 ± 0.02	ab	260 ± 5.06	a	2.59 ± 0.25	a
		Red	9.62 ± 0.71	ab	0.13 ± 0.01	ab	251 ± 12.4	a	2.52 ± 0.06	a
		Grey	9.53 ± 1.11	ab	0.16 ± 0.02	ab	269 ± 5.15	a	2.53 ±0.09	a
		Yellow	12.6 ± 0.82	a	0.19 ± 0.02	a	250 ± 8.77	a	3.00 ± 0.22	a
		White	11.1 ± 1.48	ab	0.17 ± 0.02	ab	256 ± 10.0	a	2.79 ± 0.17	a
		Control	6.86 ± 1.33	b	0.09 ± 0.01	b	261 ± 15.2	a	2.14 ± 0.25	a
	2022-07-20	Black	11.1 ± 1.10	a	0.19 ± 0.02	a	261 ± 10.4	a	2.35 ± 0.10	a
		Red	12.1 ± 0.78	a	0.21 ± 0.03	a	259 ± 5.48	a	2.51 ± 0.09	a
		Grey	10.6 ± 1.13	a	0.21 ± 0.03	a	274 ± 12.2	a	2.45 ± 0.14	a
		Yellow	13.4 ± 1.49	a	0.23 ± 0.03	a	250 ± 7.80	a	2.56 ± 0.25	a
		White	12.5 ± 0.51	a	0.23 ± 0.03	a	258 ± 8.01	a	2.71 ± 0.19	a
		Control	10.5 ± 0.78	a	0.19 ± 0.02	a	268 ± 5.08	a	2.48 ± 0.11	a
	2022-08-19	Black	3.27 ± 1.17	a	0.08 ± 0.02	a	331 ± 12.7	a	1.47 ± 0.24	a

		Red	5.62 ± 1.90	a	0.11 ± 0.03	a	310 ± 9.05	a	1.75 ± 0.22	a
		Grey	4.49 ± 1.82	a	0.09 ± 0.03	a	314 ± 13.6	a	1.53 ± 0.32	a
		Yellow	6.88 ± 1.72	a	0.15 ± 0.04	a	311 ± 12.0	a	2.12 ± 0.28	a
		White	7.61 ± 1.42	a	0.13 ± 0.02	a	288 ± 9.69	a	2.14 ± 0.21	a
		Control	5.25 ± 1.23	a	0.10 ± 0.02	a	309 ± 6.74	a	2.03 ± 0.22	a
2023	2023-06-27	Black	13.3 ± 0.58	a	0.22 ± 0.02	a	253 ± 6.31	a	2.64 ± 0.12	a
		Red	13.3 ± 0.44	a	0.19 ± 0.01	a	241 ± 6.23	a	2.51 ± 0.06	a
		Grey	13.7 ± 1.21	a	0.20 ± 0.02	a	243 ± 10.6	a	2.58 ± 0.17	a
		Yellow	13.5 ± 1.67	a	0.20 ± 0.02	a	244 ± 7.52	a	2.41 ± 0.12	a
		White	11.0 ± 1.03	a	0.19 ± 0.02	a	266 ± 5.66	a	2.59 ± 0.14	a
		Control	11.6 ± 0.66	a	0.17 ± 0.01	a	247 ± 8.43	a	2.60 ± 0.04	a
	2023-08-17	Black	3.89 ± 0.78	a	0.05 ± 0.01	a	259 ± 15.0	ab	1.21 ± 0.22	a
		Red	5.36 ± 0.44	a	0.06 ± 0.01	a	216 ± 10.1	c	1.38 ± 0.16	a
		Grey	5.74 ± 0.73	a	0.06 ± 0.01	a	226 ± 9.90	bc	1.35 ± 0.12	a
		Yellow	6.12 ± 2.28	a	0.08 ± 0.04	a	247 ± 17.1	abc	1.34 ± 0.34	a
		White	4.10 ± 1.34	a	0.07 ± 0.02	a	277 ± 17.7	a	1.30 ± 0.22	a
		Control	5.19 ± 1.44	a	0.08 ± 0.02	a	267 ± 15.3	ab	1.50 ± 0.22	a
2024	2024-07-02	Black	14.3 ± 1.20	a	0.24 ± 0.03	a	238 ± 29.1	a	2.16 ± 0.26	a
		Red	16.7 ± 0.92	a	0.21 ± 0.02	a	215 ± 14.7	a	2.12 ± 0.21	a
		Grey	15.6 ± 0.68	a	0.19 ± 0.01	a	220 ± 12.5	a	1.91 ± 0.15	a
		Yellow	17.3 ± 1.24	a	0.22 ± 0.02	a	210 ± 22.1	a	2.21 ± 0.17	a
		White	17.0 ± 0.42	a	0.22 ± 0.04	a	193 ± 33.7	a	2.11 ± 0.28	a
		Control	12.9 ± 1.41	a	0.17 ± 0.02	a	233 ± 12.0	a	2.24 ± 0.17	a
	2024-08-19	Black	15.8 ± 1.62	ab	0.31 ± 0.02	a	263 ± 13.0	a	2.85 ± 0.15	a
		Red	14.7 ± 1.37	ab	0.24 ± 0.03	a	249 ± 9.17	a	2.47 ± 0.14	ab
		Grey	14.5 ± 1.10	ab	0.23 ± 0.02	a	250 ± 9.42	a	2.56 ± 0.13	a
		Yellow	10.8 ± 0.45	b	0.13 ± 0.01	b	224 ± 7.45	a	1.93 ± 0.11	b
		White	16.4 ± 1.44	a	0.27 ± 0.03	a	244 ± 11.6	a	2.70 ± 0.13	a
		Control	15.0 ± 0.65	ab	0.25 ± 0.02	a	249 ± 11.9	a	2.90 ± 0.10	a

A_n – photosynthetic rate; *gs* – stomatal conductance; *Ci* – leaf internal concentration of CO_2; *E* – transpiration.

Table S4. Physiological parameters of apple leaves of the 'Gala Redlum' cultivar (mean ± standard error) taken in the afternoon period for each date and between years (2021-2024), as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control). Means followed by different letters within each date and year and between net cover modalities are significantly different [*Ci* in 2022 (19 Aug); *E* in 2022 (20 Jul), by Dunn's test; remaining significant cases by Tukey's test; $p \leq 0.05$].

Year	Date	Modality	A_n (μmol m^{-2} s^{-1})		g_s (mol m^{-2} s^{-1})		*Ci* (vpm)		*E* (μmol m^{2} s^{-1})	
2021	2021-07-07	Black	13.0 ± 0.51	a	0.20 ± 0.01	a	245 ± 3.19	a	2.89 ± 0.09	ab
		Red	13.6 ± 0.36	a	0.22 ± 0.01	a	245 ± 4.78	a	3.03 ± 0.10	a
		Grey	14.1 ± 0.39	a	0.20 ± 0.01	ab	233 ± 4.48	a	2.84 ± 0.08	ab
		Yellow	12.6 ± 0.68	a	0.19 ± 0.01	abc	243 ± 5.64	a	2.87 ± 0.14	ab
		White	10.2 ± 0.59	b	0.14 ± 0.01	c	242 ± 4.70	a	2.49 ± 0.09	b
		Control	9.83 ± 0.62	b	0.14 ± 0.01	bc	246 ± 5.19	a	2.55 ± 0.14	b
2022	2022-05-25	Black	10.7 ± 0.57	a	0.17 ± 0.01	a	265 ± 5.56	a	2.59 ± 0.11	a
		Red	8.49 ± 0.75	ab	0.12 ± 0.01	b	259 ± 4.55	a	2.17 ± 0.15	ab
		Grey	8.90 ± 0.66	a	0.12 ± 0.01	bc	247 ± 7.28	a	2.17 ± 0.16	ab
		Yellow	10.5 ± 0.50	a	0.15 ± 0.01	ab	253 ± 3.88	a	2.52 ± 0.13	a
		White	10.8 ± 0.49	a	0.14 ± 0.01	ab	242 ± 4.38	a	2.50 ± 0.13	a
		Control	5.94 ± 0.75	b	0.08 ± 0.01	c	252 ± 8.78	a	1.73 ± 0.13	b
	2022-07-20	Black	9.89 ± 1.29	a	0.17 ± 0.03	a	263 ± 7.18	a	2.17 ± 0.21	c
		Red	10.1 ± 1.01	a	0.16 ± 0.02	a	258 ± 4.40	a	2.20 ± 0.10	c
		Grey	10.1 ± 0.84	a	0.18 ± 0.02	a	267 ± 6.72	a	2.37 ± 0.20	bc
		Yellow	11.3 ± 0.71	a	0.21 ± 0.02	a	267 ± 7.89	a	2.48 ± 0.14	bc
		White	11.5 ± 0.70	a	0.23 ± 0.02	a	274 ± 7.19	a	2.99 ± 0.08	a
		Control	11.0 ± 0.39	a	0.21 ± 0.01	a	274 ± 4.25	a	2.86 ± 0.06	ab
	2022-08-19	Black	2.44 ± 0.62	a	0.05 ± 0.01	a	306 ± 9.90	ab	1.21 ± 0.12	b
		Red	4.42 ± 0.82	a	0.09 ± 0.02	a	299 ± 10.3	ab	1.89 ± 0.21	ab
		Grey	2.19 ± 0.59	a	0.06 ± 0.01	a	328 ± 17.9	a	1.33 ± 0.18	b
		Yellow	4.00 ± 0.62	a	0.07 ± 0.01	a	293 ± 4.35	b	1.60 ± 0.15	ab
		White	3.94 ± 1.06	a	0.08 ± 0.01	a	299 ± 12.2	ab	1.73 ± 0.23	ab
		Control	4.43 ± 0.65	a	0.10 ± 0.01	a	304 ± 7.84	ab	2.17 ± 0.20	a
2023	2023-06-27	Black	13.0 ± 0.59	a	0.21 ± 0.02	a	253 ± 3.61	a	2.82 ± 0.15	a
		Red	12.2 ± 0.81	a	0.18 ± 0.02	a	247 ± 6.90	a	2.62 ± 0.16	a
		Grey	11.8 ± 0.62	a	0.20 ± 0.03	a	253 ± 14.5	a	2.72 ± 0.22	a
		Yellow	12.7 ± 0.83	a	0.19 ± 0.02	a	245 ± 8.53	a	2.79 ± 0.13	a
		White	12.0 ± 0.77	a	0.18 ± 0.01	a	249 ± 3.57	a	2.69 ± 0.09	a
		Control	10.5 ± 0.79	a	0.15 ± 0.02	a	252 ± 3.66	a	2.62 ± 0.16	a
	2023-08-17	Black	4.13 ± 0.86	a	0.06 ± 0.01	a	254 ± 14.9	a	1.06 ± 0.10	a
		Red	4.22 ± 0.54	a	0.06 ± 0.01	a	240 ± 25.0	a	1.04 ± 0.11	a
		Grey	4.39 ± 0.64	a	0.06 ± 0.01	a	245 ± 10.7	a	1.08 ± 0.13	a
		Yellow	4.20 ± 0.93	a	0.05 ± 0.00	a	249 ± 26.6	a	1.05 ± 0.05	a
		White	5.21 ± 1.38	a	0.07 ± 0.01	a	259 ± 19.3	a	1.32 ± 0.16	a
		Control	4.69 ± 0.77	a	0.06 ± 0.01	a	233 ± 20.5	a	1.08 ± 0.17	a
2024	2024-07-02	Black	15.3 ± 1.20	a	0.23 ± 0.01	a	259 ± 15.1	a	2.24 ± 0.06	ab
		Red	14.5 ± 1.17	a	0.19 ± 0.02	a	237 ± 8.61	a	2.06 ± 0.09	b
		Grey	15.6 ± 0.87	a	0.24 ± 0.02	a	248 ± 14.8	a	2.46 ± 0.07	a
		Yellow	15.7 ± 0.63	a	0.22 ± 0.03	a	234 ± 9.69	a	2.11 ± 0.09	ab
		White	14.9 ± 1.30	a	0.17 ± 0.01	a	213 ± 20.2	a	1.92 ± 0.07	b

Year	Date	Modality	A_n (μmol m^{-2} s^{-1})		g_s (mol m^{-2} s^{-1})		Ci (vpm)		E (μmol m^2 s^{-1})	
		Control	11.9 ± 0.51	a	0.18 ± 0.02	a	255 ± 12.5	a	2.25 ± 0.12	ab
	2024-08-19	Black	14.5 ± 1.09	a	0.24 ± 0.03	a	252 ± 4.77	a	2.62 ± 0.13	a
		Red	13.6 ± 1.19	ab	0.20 ± 0.03	ab	245 ± 5.01	a	2.44 ± 0.14	a
		Grey	11.6 ± 0.98	ab	0.19 ± 0.02	ab	259 ± 10.4	a	2.35 ± 0.11	a
		Yellow	9.64 ± 0.68	b	0.12 ± 0.01	b	237 ± 7.93	a	1.83 ± 0.07	b
		White	15.1 ± 1.13	a	0.23 ± 0.02	a	243 ± 8.29	a	2.71 ± 0.12	a
		Control	14.4 ± 0.94	a	0.21 ± 0.01	a	243 ± 8.64	a	2.40 ± 0.09	a

A_n – photosynthetic rate; g_s – stomatal conductance; Ci – leaf internal concentration of CO_2; E – transpiration.

Table S5. Stomatal resistance (r_L) and conductance (g_S) of apple leaves of the 'Gala Redlum' cultivar (mean ± standard error), taken in the morning and afternoon for each date and between years (2022-2024), as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control). Means followed by different letters within each date and year and between net cover modalities are significantly different [r_L in 2024 (19 Aug; afternoon) by Games-Howell test; g_S in 2022 (20 July; morning), by Tukey's test; remaining significant cases by Dunn's test; $p \leq 0.05$].

Year	Date	Modality	r_L (s cm^{-1})				g_S (mm s^{-1})			
			Morning		Afternoon		Morning		Afternoon	
2022	2022-05-25	Black	3.53 ± 0.72	ab	2.63 ± 0.45	a	0.04 ± 0.008	ab	0.04 ± 0.007	a
		Red	3.59 ± 0.67	ab	2.42 ± 0.21	a	0.04 ± 0.011	ab	0.04 ± 0.004	a
		Grey	1.72 ± 0.30	c	2.78 ± 0.38	a	0.07 ± 0.009	a	0.04 ± 0.006	a
		Yellow	1.97 ± 0.44	bc	2.85 ± 0.47	a	0.07 ± 0.017	ab	0.04 ± 0.009	a
		White	2.95 ± 0.42	abc	2.97 ± 0.61	a	0.04 ± 0.005	ab	0.04 ± 0.007	a
		Control	7.37 ± 3.30	a	3.80 ± 0.80	a	0.02 ± 0.005	b	0.03 ± 0.007	a
	2022-07-20	Black	2.30 ± 0.92	a	2.09 ± 0.55	a	0.08 ± 0.023	ab	0.07 ± 0.015	a
		Red	1.99 ± 0.49	a	1.55 ± 0.41	a	0.07 ± 0.015	ab	0.09 ± 0.018	a
		Grey	2.26 ± 0.56	a	1.14 ± 0.11	a	0.06 ± 0.009	ab	0.09 ± 0.009	a
		Yellow	1.37 ± 0.25	a	1.73 ± 0.72	a	0.08 ± 0.011	ab	0.09 ± 0.019	a
		White	0.90 ± 0.09	a	0.88 ± 0.09	a	0.12 ± 0.011	a	0.12 ± 0.014	a
		Control	2.67 ± 0.57	a	1.18 ± 0.10	a	0.05 ± 0.015	b	0.09 ± 0.008	a
	2022-08-19	Black	11.88 ± 3.95	a	5.49 ± 0.83	a	0.02 ± 0.006	a	0.02 ± 0.003	a
		Red	4.90 ± 0.68	a	6.07 ± 1.75	a	0.02 ± 0.004	a	0.02 ± 0.006	a
		Grey	8.13 ± 1.95	a	6.98 ± 1.17	a	0.02 ± 0.003	a	0.02 ± 0.002	a
		Yellow	4.93 ± 1.70	a	3.96 ± 0.51	a	0.04 ± 0.012	a	0.03 ± 0.003	a
		White	4.47 ± 0.56	a	5.19 ± 1.31	a	0.02 ± 0.002	a	0.03 ± 0.007	a
		Control	8.28 ± 1.64	a	4.06 ± 0.55	a	0.01 ± 0.003	a	0.03 ± 0.004	a
2023	2023-06-27	Black	0.57 ± 0.02	a	n.d.		0.18 ± 0.006	a	n.d.	
		Red	0.70 ± 0.05	a	n.d.		0.15 ± 0.009	a	n.d.	
		Grey	0.64 ± 0.03	a	n.d.		0.16 ± 0.007	a	n.d.	
		Yellow	0.61 ± 0.03	a	n.d.		0.17 ± 0.011	a	n.d.	
		White	0.67 ± 0.02	a	n.d.		0.15 ± 0.006	a	n.d.	
		Control	0.71 ± 0.08	a	n.d.		0.15 ± 0.016	a	n.d.	
	2023-08-17	Black	9.73 ± 2.32	a	6.93 ± 3.33	a	0.01 ± 0.003	a	0.03 ± 0.006	a
		Red	8.32 ± 1.48	a	3.36 ± 0.33	a	0.01 ± 0.004	a	0.03 ± 0.003	a
		Grey	10.80 ± 4.42	a	4.17 ± 0.65	a	0.02 ± 0.003	a	0.03 ± 0.005	a
		Yellow	9.49 ± 2.86	a	2.82 ± 0.50	a	0.01 ± 0.002	a	0.04 ± 0.008	a
		White	8.65 ± 1.59	a	3.76 ± 0.69	a	0.01 ± 0.004	a	0.03 ± 0.006	a
		Control	7.42 ± 1.84	a	3.11 ± 0.45	a	0.02 ± 0.003	a	0.04 ± 0.004	a
2024	2024-07-02	Black	0.55 ± 0.08	b	0.55 ± 0.07	b	0.21 ± 0.038	ab	0.20 ± 0.026	a
		Red	0.68 ± 0.13	ab	1.16 ± 0.20	a	0.20 ± 0.061	ab	0.10 ± 0.020	b
		Grey	0.40 ± 0.06	b	0.97 ± 0.19	ab	0.27 ± 0.036	a	0.12 ± 0.016	ab
		Yellow	0.44 ± 0.07	b	0.69 ± 0.04	ab	0.26 ± 0.038	a	0.15 ± 0.010	ab
		White	0.49 ± 0.03	b	0.88 ± 0.12	ab	0.21 ± 0.013	ab	0.12 ± 0.014	ab
		Control	1.34 ± 0.27	a	1.25 ± 0.16	a	0.09 ± 0.016	b	0.09 ± 0.017	b
	2024-08-19	Black	0.96 ± 0.23	b	0.63 ± 0.10	b	0.16 ± 0.051	a	0.19 ± 0.035	ab
		Red	1.20 ± 0.25	ab	1.20 ± 0.25	ab	0.10 ± 0.020	ab	0.11 ± 0.028	ab
		Grey	1.25 ± 0.13	ab	1.11 ± 0.21	ab	0.09 ± 0.012	ab	0.11 ± 0.019	ab
		Yellow	1.93 ± 0.32	a	1.45 ± 0.08	a	0.06 ± 0.009	b	0.07 ± 0.005	b
		White	0.83 ± 0.20	b	0.57 ± 0.10	b	0.15 ± 0.022	a	0.21 ± 0.044	a
		Control	0.90 ± 0.11	b	0.63 ± 0.06	b	0.12 ± 0.016	a	0.17 ± 0.018	ab

n.d. – non determinate.

Table S6. Chlorophyll and reflectance indices of apple leaves of the 'Gala Redlum' cultivar (mean ± standard error) for each date and between years (2022-2024), as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control). Means followed by different letters within each date and year and between net cover modalities are significantly different (NDVI index in 2024 by Dunn's test; remaining significant cases by Tukey's test; $p \leq 0.05$).

Year	Date	Modality	CCI		NDVI		PRI	
2022	2022-05-24	Black	21.9 ± 0.65	a	0.72 ± 0.006	a	0.056 ± 0.002	a
		Red	22.7 ± 0.78	a	0.71 ± 0.006	a	0.056 ± 0.002	a
		Grey	23.5 ± 1.47	a	0.72 ± 0.008	a	0.059 ± 0.002	a
		Yellow	22.8 ± 1.00	a	0.72 ± 0.006	a	0.056 ± 0.003	a
		White	23.3 ± 1.59	a	0.72 ± 0.005	a	0.056 ± 0.001	a
		Control	25.7 ± 1.56	a	0.71 ± 0.007	a	0.053 ± 0.002	a
	2022-07-20	Black	36.5 ± 1.37	a	0.70 ± 0.005	a	0.044 ± 0.001	a
		Red	34.9 ± 1.47	a	0.70 ± 0.002	a	0.039 ± 0.002	a
		Grey	37.9 ± 1.22	a	0.71 ± 0.004	a	0.040 ± 0.002	a
		Yellow	35.7 ± 1.31	a	0.70 ± 0.006	a	0.038 ± 0.002	a
		White	38.5 ± 1.65	a	0.70 ± 0.003	a	0.045 ± 0.002	a
		Control	35.8 ± 1.80	a	0.70 ± 0.005	a	0.042 ± 0.002	a
	2022-08-19	Black	37.9 ± 1.23	a	0.64 ± 0.002	a	0.009 ± 0.004	a
		Red	35.6 ± 2.45	a	0.63 ± 0.005	a	0.006 ± 0.003	a
		Grey	39.1 ± 1.94	a	0.64 ± 0.004	a	0.006 ± 0.001	a
		Yellow	39.8 ± 1.58	a	0.63 ± 0.002	a	0.006 ± 0.001	a
		White	39.3 ± 1.82	a	0.63 ± 0.005	a	0.007 ± 0.002	a
		Control	37.7 ± 1.17	a	0.63 ± 0.006	a	-0.004 ± 0.004	a
2023	2023-06-27	Black	36.1 ± 1.43	a	0.66 ± 0.003	a	0.010 ± 0.001	ab
		Red	37.2 ± 1.40	a	0.65 ± 0.004	a	0.011 ± 0.001	ab
		Grey	36.5 ± 2.46	a	0.65 ± 0.005	a	0.014 ± 0.002	a
		Yellow	36.0 ± 2.53	a	0.66 ± 0.005	a	0.007 ± 0.002	b
		White	35.7 ± 1.18	a	0.65 ± 0.004	a	0.007 ± 0.001	b
		Control	43.2 ± 1.38	a	0.67 ± 0.004	a	0.012 ± 0.002	ab
	2023-08-17	Black	35.8 ± 2.37	a	0.73 ± 0.005	abc	0.058 ± 0.003	a
		Red	36.1 ± 1.39	a	0.72 ± 0.004	bc	0.042 ± 0.003	b
		Grey	39.6 ± 2.09	a	0.74 ± 0.006	ab	0.046 ± 0.003	ab
		Yellow	34.8 ± 1.85	a	0.74 ± 0.004	a	0.050 ± 0.003	ab
		White	30.9 ± 2.36	a	0.73 ± 0.004	abc	0.041 ± 0.002	b
		Control	35.7 ± 1.24	a	0.71 ± 0.009	c	0.044 ± 0.004	b
2024	2024-07-02	Black	35.9 ± 2.15	a	0.73 ± 0.006	a	0.030 ± 0.002	a
		Red	34.1 ± 1.38	a	0.74 ± 0.004	a	0.027 ± 0.002	a
		Grey	30.9 ± 2.21	a	0.73 ± 0.003	a	0.029 ± 0.003	a
		Yellow	33.0 ± 1.36	a	0.74 ± 0.005	a	0.028 ± 0.002	a
		White	29.5 ± 1.55	a	0.73 ± 0.003	a	0.029 ± 0.001	a
		Control	35.3 ± 1.68	a	0.73 ± 0.004	a	0.023 ± 0.002	a
	2024-08-19	Black	37.4 ± 1.59	a	0.73 ± 0.007	a	0.037 ± 0.005	a
		Red	39.7 ± 1.81	a	0.72 ± 0.002	ab	0.034 ± 0.002	a
		Grey	40.9 ± 1.61	a	0.72 ± 0.004	ab	0.038 ± 0.004	a
		Yellow	41.0 ± 3.93	a	0.71 ± 0.003	b	0.028 ± 0.002	a
		White	40.8 ± 2.91	a	0.71 ± 0.002	b	0.030 ± 0.002	a
		Control	42.9 ± 4.68	a	0.72 ± 0.003	ab	0.026 ± 0.004	a

CCI – chlorophyll content index; NDVI – normalized difference vegetation index; PRI – photochemical reflectance index.

Table S7. Maximum quantum efficiency of photosystem II with dark adaptation (*Fv*/*Fm*) and without (*Fv'*/*Fm'*) of apple leaves of the 'Gala Redlum' cultivar (mean ± standard error) for each date and between years (2020-2024), as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control). Means followed by different letters within each date and year and between net cover modalities are significantly different by Tukey's test ($p \leq 0.05$).

Year	Date	Modality	*Fv*/*Fm*		*Fv'*/*Fm'*	
2020	2020-07-14	Black	0.79 ± 0.011	a	n.d.	
		Red	0.78 ± 0.007	a	n.d.	
		Grey	0.79 ± 0.007	a	n.d.	
		Yellow	0.79 ± 0.008	a	n.d.	
		White	0.78 ± 0.008	a	n.d.	
		Control	0.78 ± 0.008	a	n.d.	
	2020-07-22	Black	0.80 ± 0.003	ab	n.d.	
		Red	0.81 ± 0.010	a	n.d.	
		Grey	0.79 ± 0.005	ab	n.d.	
		Yellow	0.78 ± 0.006	b	n.d.	
		White	0.81 ± 0.005	ab	n.d.	
		Control	0.80 ± 0.007	ab	n.d.	
	2020-08-19	Black	0.81 ± 0.007	a	n.d.	
		Red	0.82 ± 0.007	a	n.d.	
		Grey	0.81 ± 0.005	a	n.d.	
		Yellow	0.80 ± 0.005	a	n.d.	
		White	0.80 ± 0.016	a	n.d.	
		Control	0.72 ± 0.067	a	n.d.	
2021	2021-06-09	Black	0.79 ± 0.005	a	n.d.	
		Red	0.78 ± 0.008	a	n.d.	
		Grey	0.79 ± 0.008	a	n.d.	
		Yellow	0.78 ± 0.008	a	n.d.	
		White	0.78 ± 0.009	a	n.d.	
		Control	0.80 ± 0.011	a	n.d.	
	2021-07-07	Black	0.76 ± 0.021	a	n.d.	
		Red	0.77 ± 0.017	a	n.d.	
		Grey	0.74 ± 0.025	a	n.d.	
		Yellow	0.75 ± 0.024	a	n.d.	
		White	0.77 ± 0.018	a	n.d.	
		Control	0.78 ± 0.017	a	n.d.	
2022	2022-05-25	Black	0.80 ± 0.009	a	0.71 ± 0.018	a
		Red	0.79 ± 0.013	a	0.71 ± 0.017	a
		Grey	0.78 ± 0.007	a	0.69 ± 0.030	a
		Yellow	0.78 ± 0.008	a	0.68 ± 0.043	a
		White	0.79 ± 0.007	a	0.72 ± 0.025	a
		Control	0.78 ± 0.012	a	0.67 ± 0.029	a
	2022-07-20	Black	0.81 ± 0.007	a	0.61 ± 0.063	a
		Red	0.78 ± 0.025	a	0.62 ± 0.063	a
		Grey	0.81 ± 0.005	a	0.56 ± 0.086	a
		Yellow	0.78 ± 0.027	a	0.68 ± 0.061	a
		White	0.81 ± 0.009	a	0.65 ± 0.050	a
		Control	0.81 ± 0.005	a	0.61 ± 0.066	a
	2022-08-19	Black	0.79 ± 0.008	ab	0.35 ± 0.126	a
		Red	0.80 ± 0.007	a	0.53 ± 0.101	a
		Grey	0.79 ± 0.008	a	0.39 ± 0.101	a

Year	Date	Modality	*Fv/Fm*		*Fv′/Fm′*	
		Yellow	0.80 ± 0.010	a	0.36 ± 0.131	a
		White	0.79 ± 0.006	a	0.42 ± 0.113	a
		Control	0.75 ± 0.011	b	0.24 ± 0.090	a
2023	2023-06-27	Black	0.82 ± 0.008	a	0.71 ± 0.023	a
		Red	0.81 ± 0.004	a	0.70 ± 0.014	a
		Grey	0.81 ± 0.002	a	0.63 ± 0.053	a
		Yellow	0.81 ± 0.004	a	0.69 ± 0.018	a
		White	0.80 ± 0.004	a	0.54 ± 0.073	a
		Control	0.80 ± 0.008	a	0.61 ± 0.052	a
	2023-08-17	Black	0.80 ± 0.009	a	0.66 ± 0.051	a
		Red	0.79 ± 0.014	a	0.62 ± 0.057	a
		Grey	0.79 ± 0.013	a	0.56 ± 0.040	a
		Yellow	0.79 ± 0.010	a	0.67 ± 0.067	a
		White	0.78 ± 0.006	a	0.58 ± 0.086	a
		Control	0.78 ± 0.010	a	0.66 ± 0.025	a
2024	2024-07-02	Black	0.81 ± 0.010	a	0.56 ± 0.092	a
		Red	0.78 ± 0.008	a	0.60 ± 0.087	a
		Grey	0.82 ± 0.007	a	0.74 ± 0.006	a
		Yellow	0.81 ± 0.006	a	0.63 ± 0.049	a
		White	0.81 ± 0.009	a	0.60 ± 0.102	a
		Control	0.77 ± 0.028	a	0.54 ± 0.083	a
	2024-08-19	Black	0.79 ± 0.008	a	0.69 ± 0.060	a
		Red	0.82 ± 0.006	a	0.67 ± 0.048	a
		Grey	0.81 ± 0.008	a	0.60 ± 0.058	a
		Yellow	0.81 ± 0.004	a	0.73 ± 0.023	a
		White	0.82 ± 0.007	a	0.62 ± 0.063	a
		Control	0.81 ± 0.013	a	0.70 ± 0.018	a

n.d. – non determinate.

Table S8. Temperatures registered on leaves and fruits of the 'Gala Redlum' cultivar (mean ± standard error), located on the exterior (TLE and TFE) and the interior (TLI and TFI) of the canopy, at different times (11:30 a.m., 2:00, and 4:30 p.m.) in 2024, as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control). Means followed by different letters within each year and between net cover modalities are significantly different (TFE at 2:00 p.m. by Games-Howell test; TLE and TLI at 11:30 a.m. and TFE at 4:30 p.m. by Dunn's test; remaining significant cases by Tukey's test; $p \leq 0.05$).

			Modality					
Year	**Parameter**	**Time**	**Black**	**Red**	**Grey**	**Yellow**	**White**	**Control**
2024	TLE	11:30 a.m.	33.8 ± 0.24 bc	36.6 ± 0.78 a	34.1 ± 0.52 bc	33.1 ± 0.47 c	35.0 ± 0.36 ab	32.9 ± 0.36 c
		02:00 p.m.	34.5 ± 0.65 abc	36.8 ± 0.66 a	32.3 ± 0.46 c	33.5 ± 0.61 bc	35.6 ± 0.38 ab	36.6 ± 0.60 a
		04:30 p.m.	36.7 ± 0.31 ab	37.9 ± 0.70 a	38.5 ± 0.57 a	37.5 ± 0.37 ab	35.3 ± 0.56 b	38.7 ± 0.81 a
	TLI	11:30 a.m.	31.3 ± 0.20 ab	32.7 ± 0.64 a	30.9 ± 0.23 bc	30.2 ± 0.29 c	31.2 ± 0.25 ab	30.8 ± 0.32 bc
		02:00 p.m.	32.4 ± 0.20 c	34.1 ± 0.37 a	30.3 ± 0.30 d	31.2 ± 0.42 cd	32.4 ± 0.37 bc	33.7 ± 0.18 ab
		04:30 p.m.	35.6 ± 0.19 a	35.5 ± 0.35 a	35.8 ± 0.41 a	34.9 ± 0.46 a	32.1 ± 0.19 b	34.7 ± 0.25 a
	TFE	11:30 a.m.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
		02:00 p.m.	43.1 ± 0.83 bc	44.7 ± 0.83 ab	38.8 ± 1.30 c	39.9 ± 0.74 c	46.0 ± 0.52 ab	47.9 ± 0.87 a
		04:30 p.m.	46.3 ± 0.28 b	47.7 ± 0.29 ab	46.5 ± 0.53 b	45.6 ± 1.42 b	46.7 ± 0.87 b	51.2 ± 0.58 a
	TFI	11:30 a.m.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
		02:00 p.m.	34.8 ± 0.23 ab	36.1 ± 0.23 a	32.5 ± 0.43 c	33.8 ± 0.33 bc	35.8 ± 0.39 a	35.6 ± 0.75 ab
		04:30 p.m.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.

Table S9. Average yield percent of apple fruit of the 'Gala Redlum' cultivar per caliber (between < 50 and > 80), between 2020 and 2024, as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control).

		Average fruit yield per caliber (%)							
Year	**Modality**	**[<50]**	**[50-55]**	**[55-60]**	**[60-65]**	**[65-70]**	**[70-75]**	**[75-80]**	**[>80]**
2020	Black	0.90	0.33	2.89	24.96	24.47	38.41	6.07	1.96
	Red	0.26	1.08	0.69	27.57	35.94	28.71	5.75	0.00
	Grey	0.38	0.29	1.79	17.18	24.54	49.82	5.45	0.55
	Yellow	5.64	2.67	12.29	28.49	20.64	25.51	4.75	0.00
	White	1.23	0.18	3.30	19.22	32.44	40.70	2.94	0.00
	Control	1.20	2.41	9.24	24.90	32.53	26.10	2.81	0.80
2021	Black	0.06	0.00	3.19	23.42	22.65	41.72	6.91	2.04
	Red	0.28	0.64	3.63	30.00	30.92	27.69	6.85	0.00
	Grey	0.08	0.53	9.85	40.35	33.76	14.17	1.26	0.00
	Yellow	0.07	0.39	4.98	24.66	26.82	36.54	5.89	0.65
	White	0.66	0.90	1.41	19.96	25.84	39.76	10.21	1.26
	Control	0.21	0.52	2.68	17.22	19.80	43.36	15.55	0.66
2022	Black	0.76	0.79	2.13	10.92	25.36	42.67	13.78	3.60
	Red	1.14	1.53	4.56	22.44	20.41	43.92	5.50	0.50
	Grey	2.03	1.24	4.69	8.92	13.43	41.26	19.19	9.24
	Yellow	3.56	2.92	10.47	19.07	21.16	31.69	9.82	1.32
	White	1.67	0.92	5.59	26.05	23.32	34.66	7.35	0.45
	Control	2.52	0.75	6.61	17.60	21.37	32.73	12.96	5.46
2023	Black	1.18	2.02	17.48	37.67	19.32	19.75	2.57	0.00
	Red	1.02	3.43	20.34	40.96	18.02	13.95	1.64	0.65
	Grey	1.19	1.65	16.43	36.89	21.70	18.51	3.04	0.59
	Yellow	0.31	0.51	4.52	29.53	28.02	27.83	5.25	4.04
	White	2.21	3.39	20.84	34.33	19.25	16.67	2.24	1.08
	Control	0.52	0.76	6.00	25.44	25.51	33.90	6.60	1.25
2024	Black	0.52	0.77	12.77	35.84	20.32	25.02	4.07	0.68
	Red	0.97	3.12	21.02	39.15	17.82	13.43	4.09	0.40
	Grey	2.29	9.63	32.30	38.91	10.21	5.65	0.50	0.51
	Yellow	1.55	6.82	28.77	35.96	15.70	10.64	0.55	0.00
	White	0.53	2.09	13.77	40.95	20.59	18.18	3.37	0.51
	Control	0.05	0.46	10.00	26.61	21.78	33.27	7.27	0.54

n.d. – non determinate.

Table S10. Average yield value of apple fruit of the 'Gala Redlum' cultivar, per caliber and total per modality, between 2021 and 2024, as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control).

		Average fruit yield per caliber (€/ha)								
Year	**Modality**	**[50]**	**[50-55]**	**[55-60]**	**[60-65]**	**[65-70]**	**[70-75]**	**[75-80]**	**[>80]**	**Total**
2020	Black	0.00	3.81	67.31	1 626.86	2 278.37	5 364.45	890.11	320.04	10 551
	Red	0.00	11.75	14.92	1 680.22	3 129.31	3 749.07	788.10	0.00	9 373
	Grey	0.00	3.81	46.36	1 244.61	2 540.01	7 734.34	888.12	100.01	12 557
	Yellow	0.00	26.04	239.71	1 555.76	1 610.37	2 985.15	584.08	0.00	7 001
	White	0.00	1.90	69.21	1 129.02	2 722.86	5 124.41	388.05	0.00	9 435
	Control	0.00	20.43	156.61	1 182.08	2 206.19	2 655.60	300.29	95.33	6 617
2021	Black	0.00	0.00	119.06	2 444.75	3 378.20	9 334.50	1 624.20	533.40	17 434
	Red	0.00	10.98	124.88	2 889.24	4 254.48	5 714.98	1 483.51	0.00	14 478
	Grey	0.00	11.11	410.11	4 704.32	5 624.01	3 540.14	330.04	0.00	14 620
	Yellow	0.00	7.28	185.74	2 575.14	4 000.50	8 175.62	1 383.51	170.39	16 498
	White	0.00	13.23	41.28	1 636.50	3 026.84	6 985.01	1 883.57	257.44	13 844
	Control	0.00	6.61	68.79	1 237.19	2 032.00	6 673.85	2 513.65	118.53	12 651
2022	Black	0.00	8.95	48.52	697.01	2 312.59	5 835.76	1 979.45	574.10	11 456
	Red	0.00	18.59	110.98	1 528.80	1 986.46	6 412.15	842.47	85.45	10 985
	Grey	0.00	9.18	69.23	368.60	792.99	3 653.44	1 784.24	954.53	7 632
	Yellow	0.00	40.76	292.39	1 490.14	2 362.26	5 307.20	1 726.10	257.68	11 477
	White	0.00	17.52	213.11	2 783.36	3 558.58	7 933.86	1 766.13	120.14	16 393
	Control	0.00	7.59	133.96	997.71	1 731.18	3 976.51	1 653.73	774.48	9 275
2023	Black	0.00	43.66	755.45	4 557.52	3 339.55	5 119.80	699.32	0.00	14 515
	Red	0.00	63.31	751.70	4 239.28	2 664.18	3 092.96	382.07	167.58	11 361
	Grey	0.00	32.17	640.16	4 024.07	3 381.57	4 325.86	746.98	160.04	13 311
	Yellow	0.00	8.98	159.59	2 922.36	3 961.31	5 900.75	1 168.58	998.78	15 120
	White	0.00	63.04	775.58	3 576.37	2 864.99	3 722.16	523.99	281.84	11 808
	Control	0.00	12.66	199.42	2 367.96	3 391.25	6 761.39	1 382.67	291.75	14 407
2024	Black	0.00	18.72	624.83	4 908.73	3 975.03	7 343.96	1 253.88	233.01	18 358
	Red	0.00	81.01	1 092.83	5 698.93	3 704.57	4 187.50	1 339.67	147.22	16 252
	Grey	0.00	275.53	1 848.96	6 237.12	2 338.79	1 940.37	179.29	205.25	13 025
	Yellow	0.00	189.80	1 602.46	5 608.06	3 498.03	3 555.69	191.72	0.00	14 646
	White	0.00	59.37	781.28	6 504.21	4 672.93	6 189.97	1 205.33	202.40	19 615
	Control	0.00	9.90	427.46	3 184.74	3 723.59	8 532.15	1 958.25	161.03	17 997

n.d. – non determinate; Fruit average price per caliber was calculated based on the national supply market prices for all the years evaluated. The following prices were considered: <50 mm, 0.00 €; 50-55 mm, 0.05 €; 55-60 mm, 0.10 €; 60-65 mm, 0.28 €; 65-70 mm, 0.40 €; 70-75 mm, 0.60 €; 75-80 mm, 0.63 €; >80 mm, 0.70 €.

Table S11. Fruit quality parameters of the 'Gala Redlum' cultivar (mean ± standard error) taken in each year (2020-2024) as a function of the net cover modality with different shading levels: Black (≈22.4%), Red (≈20.6%), Grey (≈15.7%), Yellow (≈14.7%), White (≈9.6%), and for apple trees without net cover (control). Means followed by different letters within each year and between net cover modalities are significantly different (dry matter in 2020 by Games-Howell test; firmness in 2020, diameter in 2020, 2021 and 2024, weigh in 2020 and 2024, dry matter in 2021, and starch in 2022 and 2024, by Dunn's test; remaining significant cases by Tukey's test; $p \leq 0.05$).

Year	Modality	Firmness (kg cm²)		Diameter (mm)		Height (mm)		Weight (g)		Dry matter (%)		Starch index (1–10)		SSC (°Brix)	
2020	Black	7.12 ± 0.20	ab	67.9 ± 0.24	bc	57.2 ± 0.66	b	128 ± 6.11	b	17.2 ± 0.39	ab	n.d.		14.3 ± 0.16	ab
	Red	6.72 ± 0.21	b	68.9 ± 0.42	ab	57.6 ± 0.70	b	138 ± 2.59	ab	17.5 ± 0.23	ab	n.d.		14.3 ± 0.17	ab
	Grey	7.04 ± 0.24	ab	67.8 ± 0.31	c	57.2 ± 0.67	b	130 ± 1.54	b	16.8 ± 0.11	b	n.d.		14.4 ± 0.25	a
	Yellow	6.90 ± 0.22	b	67.6 ± 0.32	c	56.6 ± 0.62	b	130 ± 1.45	b	18.3 ± 0.11	a	n.d.		15.2 ± 0.30	a
	White	6.89 ± 0.23	b	67.9 ± 0.26	abc	57.2 ± 0.64	b	134 ± 1.44	ab	15.2 ± 0.24	c	n.d.		13.4 ± 0.24	b
	Control	7.71 ± 0.19	a	70.1 ± 0.66	a	61.7 ± 0.92	a	149 ± 3.79	a	17.3 ± 0.25	ab	n.d.		14.2 ± 0.24	ab
2021	Black	7.65 ± 0.11	abc	68.6 ± 0.20	a	66.5 ± 0.74	a	147 ± 1.86	a	16.1 ± 0.14	bc	n.d.		13.2 ± 0.14	c
	Red	7.54 ± 0.16	bc	68.4 ± 0.17	a	64.3 ± 0.58	abc	144 ± 1.51	a	15.5 ± 0.19	bc	n.d.		13.6 ± 0.17	bc
	Grey	8.13 ± 0.11	ab	68.6 ± 0.18	a	63.6 ± 0.74	bc	143 ± 1.66	a	15.0 ± 0.20	c	n.d.		12.2 ± 0.20	d
	Yellow	7.61 ± 0.15	bc	68.3 ± 0.22	a	65.0 ± 0.62	ab	145 ± 2.10	a	16.5 ± 0.38	ab	n.d.		14.2 ± 0.24	b
	White	8.24 ± 0.17	a	68.4 ± 0.21	a	63.9 ± 0.62	abc	145 ± 2.14	a	17.5 ± 1.24	ab	n.d.		14.3 ± 0.23	b
	Control	7.44 ± 0.16	c	67.6 ± 0.24	b	61.6 ± 0.73	c	139 ± 2.08	a	17.8 ± 0.29	a	n.d.		15.5 ± 0.22	a
2022	Black	6.00 ± 0.20	a	67.7 ± 0.22	a	63.2 ± 0.56	a	139 ± 1.44	a	15.9 ± 0.33	b	8.15 ± 0.37	abc	14.4 ± 0.18	b
	Red	6.03 ± 0.27	a	67.2 ± 0.23	a	59.9 ± 0.59	bc	131 ± 2.00	c	16.6 ± 0.17	ab	7.50 ± 0.47	bc	14.4 ± 0.15	b
	Grey	6.53 ± 0.21	a	67.8 ± 0.28	a	61.6 ± 0.56	ab	140 ± 1.78	a	17.2 ± 0.09	a	7.90 ± 0.43	bc	14.3 ± 0.19	b
	Yellow	6.50 ± 0.20	a	67.5 ± 0.17	a	63.2 ± 0.60	a	139 ± 1.59	ab	14.5 ± 0.50	c	7.27 ± 0.28	c	14.6 ± 0.15	b
	White	5.68 ± 0.16	a	67.0 ± 0.24	a	58.8 ± 0.61	c	132 ± 1.67	bc	15.9 ± 0.13	b	8.70 ± 0.16	ab	14.1 ± 0.14	b
	Control	5.81 ± 0.23	a	67.4 ± 0.21	a	60.8 ± 0.61	bc	136 ± 1.85	abc	17.7 ± 0.31	a	9.35 ± 0.23	a	15.6 ± 0.20	a
2023	Black	5.85 ± 0.18	b	67.3 ± 0.14	a	61.3 ± 0.58	a	134 ± 1.43	a	17.1 ± 0.34	b	9.30 ± 0.29	ab	14.9 ± 0.15	c
	Red	5.88 ± 0.14	ab	67.7 ± 0.17	a	61.4 ± 0.58	a	136 ± 1.43	a	17.5 ± 0.22	ab	8.65 ± 0.31	ab	15.3 ± 0.11	bc
	Grey	6.48 ± 0.18	a	67.6 ± 0.16	a	60.3 ± 0.54	a	134 ± 1.57	a	17.4 ± 0.08	ab	8.30 ± 0.30	b	15.1 ± 0.11	c
	Yellow	5.91 ± 0.13	ab	68.8 ± 1.69	a	59.9 ± 0.57	a	131 ± 1.52	a	17.7 ± 0.10	ab	9.25 ± 0.23	ab	15.4 ± 0.17	abc
	White	6.03 ± 0.14	ab	67.6 ± 0.17	a	59.7 ± 0.46	a	134 ± 1.48	a	17.8 ± 0.08	ab	8.95 ± 0.20	ab	15.6 ± 0.14	ab
	Control	5.85 ± 0.15	b	67.2 ± 0.19	a	61.6 ± 0.59	a	135 ± 1.63	a	18.1 ± 0.21	a	9.35 ± 0.15	a	15.8 ± 0.13	a

Year	Modality	Firmness (kg cm²)		Diameter (mm)		Height (mm)		Weight (g)		Dry matter (%)		Starch index (1–10)		SSC (°Brix)	
2024	Black	6.42 ± 0.15	ab	66.7 ± 0.25	b	60.2 ± 0.60	a	135 ± 1.56	b	15.0 ± 0.36	c	8.20 ± 0.30	ab	12.4 ± 0.16	c
	Red	6.22 ± 0.14	ab	66.7 ± 0.22	b	62.6 ± 0.53	a	137 ± 1.51	ab	15.5 ± 0.15	bc	7.75 ± 0.32	ab	13.0 ± 0.18	abc
	Grey	6.06 ± 0.13	b	68.0 ± 0.40	a	61.8 ± 0.68	a	144 ± 2.86	a	15.5 ± 0.25	bc	8.75 ± 0.39	a	12.9 ± 0.19	bc
	Yellow	6.34 ± 0.18	ab	66.8 ± 0.18	b	60.7 ± 0.49	a	138 ± 1.32	ab	16.2 ± 0.29	ab	7.75 ± 0.43	ab	13.3 ± 0.16	ab
	White	6.77 ± 0.15	a	67.7 ± 0.21	a	61.0 ± 0.59	a	135 ± 1.70	b	15.6 ± 0.17	bc	7.45 ± 0.29	b	12.6 ± 0.18	bc
	Control	6.34 ± 0.16	ab	66.3 ± 0.26	b	61.4 ± 0.53	a	140 ± 1.31	a	16.8 ± 0.25	a	7.65 ± 0.32	b	13.6 ± 0.19	a

SSC – soluble solids content; n.d. – non determinate.

Table S12. Principal component (PC) scores (mean ± standard error) as a function of year (2022 to 2024) and net cover modality with different shading levels: Black (FE≈22.4%), Red (FE≈20.6%), Grey (FE≈15.7%), Yellow (FE≈14.7%), White (FE≈9.6%), and for apple trees without net cover (control). Means followed by different letters within each year and between net cover modalities are significantly different by Tukey's test ($p \leq 0.05$).

Year	Modality	PC1		PC2		PC3	
2022	Black	1.31 ± 0.12	a	-0.89 ± 0.50	a	-0.35 ± 0.58	a
	Red	1.30 ± 0.11	a	-0.08 ± 0.40	a	-0.43 ± 0.71	a
	Grey	1.10 ± 0.09	a	-0.59 ± 0.34	a	-0.34 ± 0.11	a
	Yellow	1.26 ± 0.04	a	0.07 ± 0.38	a	0.17 ± 0.38	a
	White	1.24 ± 0.10	a	0.09 ± 0.15	a	0.34 ± 0.33	a
	Control	1.53 ± 0.04	a	-0.25 ± 0.24	a	-0.39 ± 0.21	a
2023	Black	-1.04 ± 0.08	b	-1.07 ± 0.26	a	0.07 ± 0.24	ab
	Red	-0.98 ± 0.09	b	-0.80 ± 0.12	a	0.03 ± 0.22	ab
	Grey	-1.11 ± 0.09	b	-1.01 ± 0.28	a	0.48 ± 0.31	a
	Yellow	-0.99 ± 0.13	b	-0.43 ± 0.33	a	-0.85 ± 0.19	bc
	White	-0.81 ± 0.15	ab	-0.51 ± 0.29	a	-1.41 ± 0.25	c
	Control	-0.46 ± 0.13	a	-0.55 ± 0.39	a	-0.73 ± 0.39	bc
2024	Black	-0.49 ± 0.15	bcd	1.61 ± 0.24	a	-0.58 ± 0.22	a
	Red	-0.32 ± 0.07	bc	0.95 ± 0.14	ab	0.57 ± 0.30	a
	Grey	-0.90 ± 0.12	d	0.73 ± 0.15	bc	0.85 ± 0.35	a
	Yellow	-0.71 ± 0.06	cd	0.13 ± 0.08	c	1.02 ± 0.36	a
	White	-0.17 ± 0.09	ab	1.34 ± 0.19	ab	0.80 ± 0.45	a
	Control	0.23 ± 0.18	a	1.25 ± 0.07	ab	0.73 ± 0.56	a