Table S1. Climate, soil, and main forest stand characteristics of two artificial black pine plantations, Pratomagno and Amiata, located in Tuscany (central Italy) before thinning (2015).

	Pratomagno	**Amiata**
Topographic parameters		
Geographical coordinate	4830707N; 1718606E	4757300N;1714428E
Altitude a.s.l. (m)	1150	730
Slope (%)	40	15
Climate parameters		
Köppen climate types	Csa	Csb
Mean air T (°C)	10.1	13.1
Mean annual rainfall (mm)	964	797
Soil physical parameters		
Sand (%)	46.7±2.6	19.2±2.1
Silt (%)	39.7±2.5	49.1±2.0
Clay (%)	13.7±0.9	31.7±0.9
USDA Class	Loam	Silty Clay Loam
Bulk density (g cm^{-3})	0.87±0.04	1.34±0.02
Soil chemical properties		
Soil pH	4.7±0.2	7.6±0.09
Electrical conductivity (μS cm^{-1})	0.29±0.05	0.28±0.01
Total $CaCO_3$ (%)	0	9.9±2.8
Total Nitrogen (%)	0.4±0.04	0.3±0.03
Organic matter (%)	7.7±0.95	6.9±0.5
CSC	16.1±1.4	21.8±0.9
Main forest stand characteristics		
Age (years)	59	44
Pinus nigra trees density (Stems ha^{-1})	889±241.2	959±270
Other species trees density (Stems ha^{-1})	188±40	91±13.0
Basal area (m^2 ha^{-1}) – *Pinus nigra*	59.1±11.2	43.6±9.7
Basal area (m^2 ha^{-1}) – Other species	9,5±0.25	1.2±0.6
Quadratic mean diameter (cm) – *Pinus nigra*	29.5±2.5	24.3±2.7
Quadratic mean diameter (cm) – Other species	20.5±8.6	16.7±5.8
Mean height (m) – *Pinus nigra*	19.2±0.7	18.1±0.8
Mean height (m) – Other species	15.5±4.5	12.8±3.3
Standing volume (m^3 ha^{-1}) – *Pinus nigra*	538.4±123.2	386.4±120.0
Standing volume (m^3 ha^{-1}) – Other species	94.2±15.1	7.7±3.85
Crown Volume (m^3 ha^{-1})	45785.2±11390.5	45139.8±19234.7
PAR (%)	11.9±4.7	13.6±7.6

Table S2. Comparison between weather stations in Pratomagno and Amiata sites. Stations of Regional Hydrological service were located at Villa Cognola (rain) and Vallombrosa (temp.) for the Pratomagno site and at Castiglio d'Orcia for the Amiata site.

Weather station	Stations of Regional Hydrological service	This study		
PRATOMAGNO				
Years	**1996-2018**	**2016**	**2017**	**2018**
Annual rain (mm)	963,5	1125,8	735,0	1061,0
Summer months rain (mm)	134,4	147,6	61,4	88,8
Mean annual temp. (°C)	10,1	10,2	10,4	10,4
Mean summer months temp. (°C)	18,4	17,8	20,3	18,4
AMIATA				
Years	**1997-2018**	**2016**	**2017**	**2018**
Annual rain (mm)	792,4	1113,4	514,9	924,4
Summer months rain (mm)	128,0	225,2	51,4	155,2
Mean annual temp. (°C)	13,1	11,6	11,8	11,8
Mean summer months temp. (°C)	21,6	18,9	21,8	19,6

Table S3. SIMPER analysis (TB = Thinning from below; ST = Selective thinning; CTR = Control without thinning) on the abundance of nematode taxa (number of nematodes/ml of soil) in Pratomagno site in 2016. Standard errors (±) are reported.

Taxa	Average dissimilarity	Cumulative contribution %	Mean abundance		
			TB	ST	CTR
Dorylaimidae	5.18	16.9	13.7±2.3	23.3±2.3	53.3±10.2
Tylenchidae	4.78	30.93	8.3±6.9	9.0±3.8	18.3±15.3
Paratylenchidae	4.77	45.73	0	25.7±24.2	1.3±0.7
Rhabditidae	4.12	58.52	26.3±11.3	46.7±6.7	53.3±1.9
Cephalobidae	3.43	69.16	6.7±4.4	3.7±3.7	0
Seinuridae	2.70	77.56	0	1.7±0.9	3.3±1.2
Longidoridae	2.56	85.51	4.0±1.0	1.0±0.6	6.3±0.7
Mononchidae	1.92	91.48	3.7±2.0	4.0±0	3.3±1.9
Anguinidae	1.10	94.93	0.3±0.3	0	1.0±1.0
Criconematidae	0.88	97.66	0.7±0.7	0.3±0.3	0
Aphelenchidae	0.75	100	3.3±0.7	3.7±0.9	2.7±0.7
Total	**32.19%**		**67.0±24.5**	**119.0±35.0**	**143.0±13.6**

Table S4. SIMPER analysis (TB = Thinning from below; ST = Selective thinning; CTR = Control without thinning) on the abundance of nematode taxa (number of nematodes/ml of soil) in Pratomagno site in 2018. Standard errors (±) are reported.

Taxa	Average dissimilarity	Cumulative contribution %	Mean abundance		
			TB	ST	CTR
Dorylaimidae	7.90	21.11	25.3±15.4	2.7±1.5	3.7±1.3
Tylenchidae	5.65	36.19	16.3±5.9	2.3±0.3	4.7±0.3
Rhabditidae	5.55	51.00	32.7±22.2	5.7±1.8	7.0±1.2
Mononchidae	4.27	62.40	15.0±14.0	0	0
Anguinidae	3.37	71.41	1.0±0.6	0.3±0.3	1.3±0.9
Hoplolaimidae	2.91	79.17	1.7±0.9	0	0.3±0.3
Aphelenchidae	2.76	86.53	5.7±1.8	2.3±0.9	3.7±0.9
Cephalobidae	2.47	93.13	10.3±10.3	0	0
Discolaimidae	1.36	96.76	0.7±0.7	0	0
Pratylenchidae	0.77	98.82	1.0±1.0	0	0
Longidoridae	0.44	100	0.3±0.3	0	0
Total	**37.45%**		**110.0±70.5**	**11.0±5.0**	**20.7±1.8**

Table S5. SIMPER analysis (TB = Thinning from below; ST = Selective thinning; CTR = Control without thinning) on the abundance of nematode taxa (number of microarthropods/dm^3 of soil) in Pratomagno site in 2017. Standard errors (±) are reported.

Taxa	Average dissimilarity	Cumulative contribution %	Mean abundance		
			TB	ST	CTR
Collembola	9.14	24.76	26.9±5.1	22.0±5.5	75.0±21.2
Acarina	6.78	43.12	35.6±7.4	32.6±8.9	42.1±12.4
Chilopoda	5.06	56.83	0.9±0.6	6.8±3.7	6.8±3.7
Diptera	3.60	66.58	3.7±1.1	4.9±1.5	3.7±1.0
Coleoptera	2.98	74.65	2.0±0.3	0.6±0.3	2.3±0.6
Hymenoptera	2.07	80.24	0.9±0.8	0.2±0.1	1.2±0.4
Pauropoda	2.05	85.80	1.1±0.8	1.6±1.0	0.1±0.1
Tysanoptera	1.43	89.68	0.3±0.2	0.3±0.2	0.4±0.2
Hemiptera	0.85	91.98	0	0.2±0.2	0.4±0.2
Pseudoscorpiones	0.83	94.23	0.4±0.2	0	0.1±0.1
Diplopoda	0.83	96.47	0.3±0.2	0.1±0.1	0.1±0.1
Araneae	0.56	97.98	0	0	0.3±0.2
Psocoptera	0.40	99.07	0	0.1±0.1	0.1±0.1
Symphyla	0.32	100	0	0	0.2±0.1
Total	**36.90%**		**76.4±12.9**	**63.4±12.9**	**133.0±31.0**

Table S6. SIMPER analysis (TB = Thinning from below; ST = Selective thinning; CTR = Control without thinning) on the abundance of nematode taxa (number of microarthropods/dm^3 of soil) in Pratomagno site in 2016. Standard errors (±) are reported.

Taxa	Average dissimilarity	Cumulative contribution %	Mean abundance		
			TB	ST	CTR
Acarina	8.21	23.86	45.7±12.1	77.1±15.5	102.9±24.2
Collembola	7.12	44.58	65.9±28.4	50.7±9.1	54.8±10.1
Hymenoptera	2.78	52.67	5.6±3.9	1.0±0.4	3.1±0.7
Pauropoda	2.38	59.60	4.2±3.0	2.3±0.7	0.9±0.3
Diptera	2.22	66.04	5.9±1.8	4.4±0.8	3.2±0.8
Symphyla	1.74	71.10	1.0±0.5	1.9±0.6	1.0±0.3
Diplura	1.71	76.06	0.3±0.2	1.3±0.5	1.3±0.5
Chilopoda	1.48	80.35	0.6±0.3	1.2±0.6	0.6±0.2
Coleoptera	1.38	84.38	2.1±0.5	2.1±0.5	3.6±0.8
Diplopoda	1.37	88.35	0.9±0.5	0.1±0.1	0.9±0.3
Hemiptera	1.16	91.73	0	0.3±0.3	1.1±0.5
Tysanoptera	0.88	94.29	0.1±0.1	0.3±0.2	0.4±0.2
Opilionida	0.77	96.54	0.1±0.1	0	0.7±0.3
Araneae	0.75	98.73	0.3±0.2	0.2±0.2	0.3±0.2
Pseudoscorpiones	0.29	99.58	0.1±0.1	0	0.1±0.1
Psocoptera	0.15	100	0	0.1±0.1	0
Total	**34.39%**		**132.8±36.4**	**143.2±18.5**	**174.9±31.6**

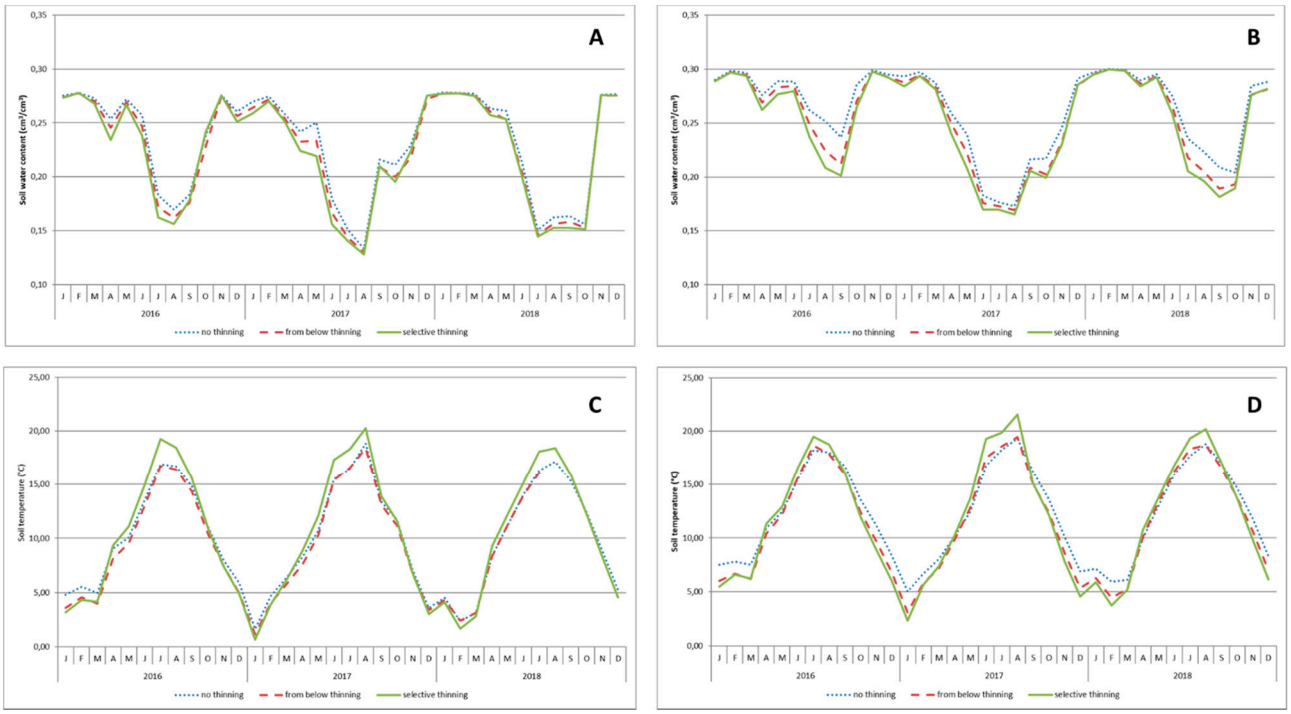

Figure S1. Soil water content and soil temperature measured in three plots with three treatments. A, C, Pratomagno site; B, D, Amiata site.