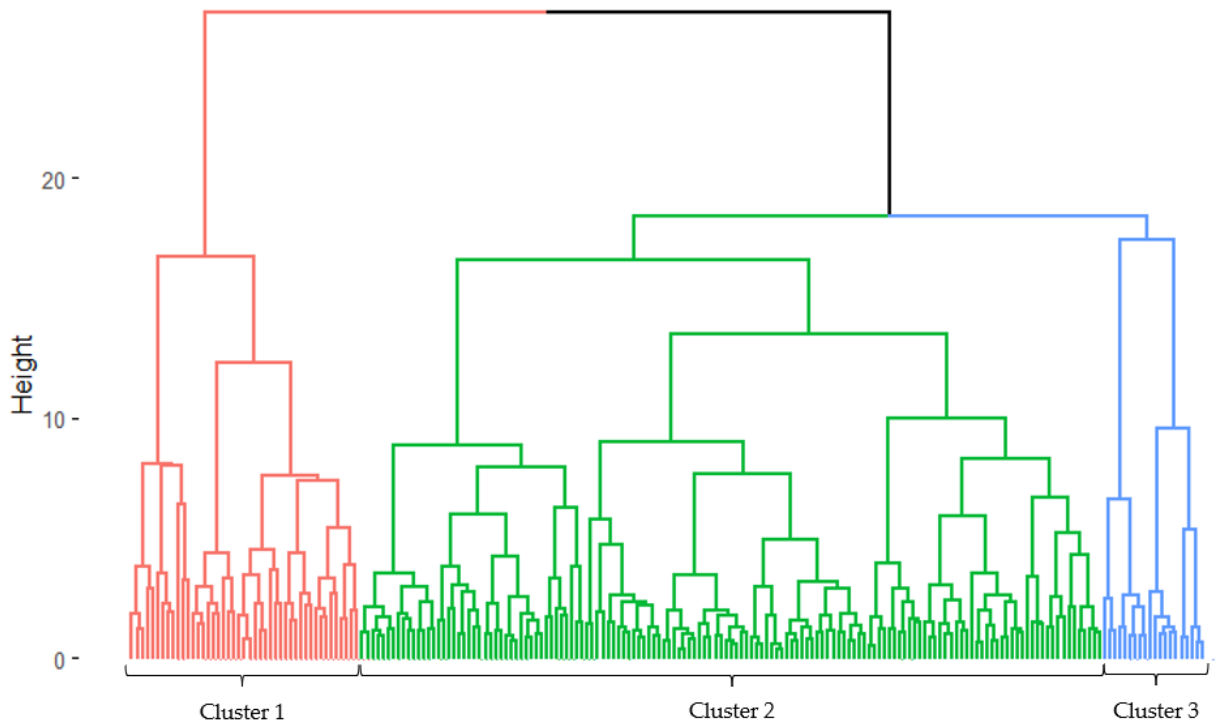

Figure S1. Dendrogram obtained via hierarchical cluster analysis performed on soil samples from 400–1000 m above sea level.

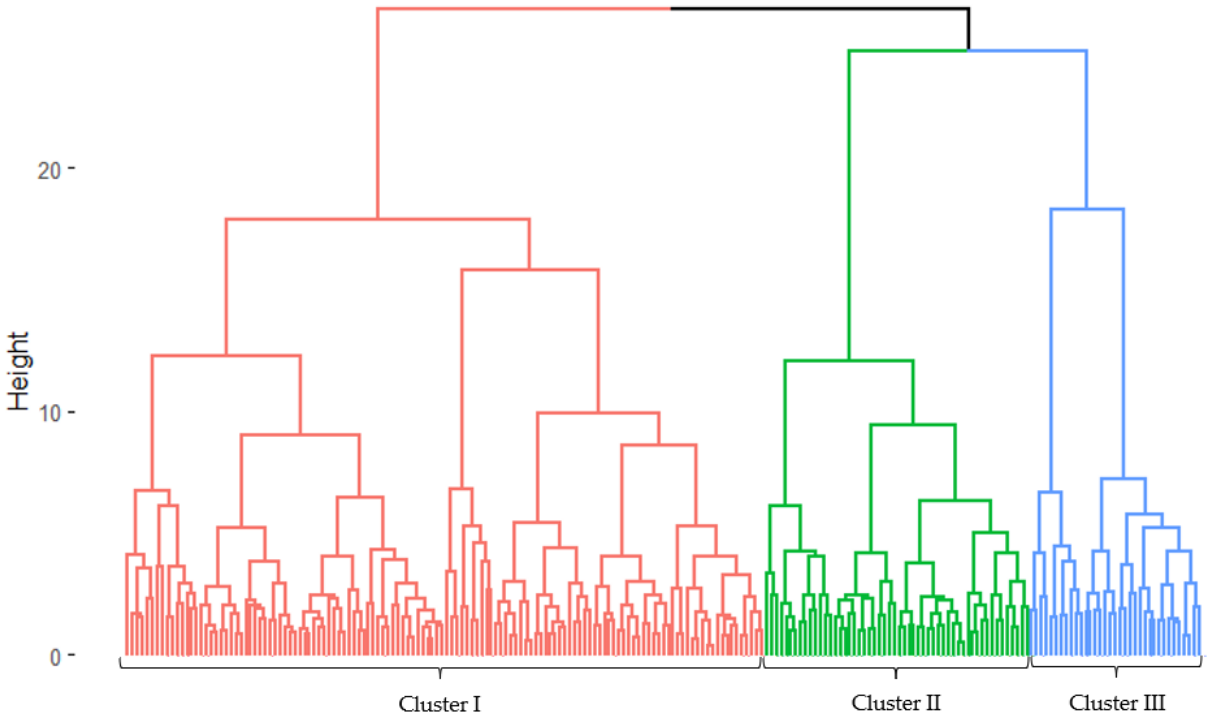

Figure S2. Dendrogram obtained via hierarchical cluster analysis performed on soil samples at 1000–2134 m above sea level.

Table S1. Soil type, coordinates, aspect, slope gradient, vegetation type, and altitude of plots under investigation.

Plot	Soil type	Coordinates (WGS84/UTM zone 32)		Aspect	Slope	Vegetation	Altitude
		m E	m N		°		m a.s.l.
A1	HUMIC LITHIC DYSTRUDEPT	627195	4886539	N	30_50	BLB	1770
A2	HUMIC LITHIC DYSTRUDEPT	626244	4888557	E	>50	BLB	1760
A3	HUMIC DYSTRUDEPT	627225	4886628	N	10_30	BLB	1750
A4	HUMIC DYSTRUDEPT	626300	4888621	E	>50	BEF	1720
A40	TYPIC DYSTRUDEPTS	627259	4887352	N	0_10	BEF	1602
A41	TYPIC DYSTRUDEPTS	627165	4887374	W	10_30	BEF	1598
A45	TYPIC DYSTRUDEPTS	627358	4887628	N	0_10	BEF	1601
A46	TYPIC DYSTRUDEPTS	627298	4887626	W	10_30	BEF	1593
A47	TYPIC DYSTRUDEPTS	627061	4887197	N	10_30	BLB	1596
A48	TYPIC DYSTRUDEPTS	627045	4887229	N	10_30	BLB	1579
A5	HUMIC DYSTRUDEPT	626245	4888735	N	30_50	BLB	1685
B20	TYPIC DYSTRUDEPTS	668692	4887022	N	10_30	MF	958
B21	TYPIC DYSTRUDEPTS	668011	4887414	S	10_30	MF	932
C1	TYPIC UDORTHENT	636811	4895267	E	10_30	GS	1710
C10	LITHIC UDORTHENT	637590	4896438	S	10_30	CON	1704
C11	LITHIC UDORTHENT	637383	4895256	S	10_30	BEF	1689
C12	LITHIC UDORTHENT	637191	4896547	E	10_30	CON	1654
C13	LITHIC HAPLOHUMODS	637124	4896456	N	10_30	BEF	1742
C14	LITHIC UDORTHENT	637093	4896241	S	0_10	BEF	1709
C15	LITHIC UDORTHENT	637285	4895977	W	10_30	BEF	1695
C16	LITHIC UDORTHENT	636086	4896647	N	10_30	CON	1626
C17	LITHIC UDORTHENT	636370	4896769	W	10_30	BEF	1610
C18	LITHIC CRYORTHENT	635945	4894668	N	0_10	GS	2134
C19	LITHIC CRYORTHENT	635936	4894836	N	30_50	GS	2119
C2	TYPIC UDORTHENT	637080	4895192	N	10_30	CON	1697
C20	LITHIC DYSTRUDEPT	636625	4895567	E	10_30	GS	1869
C21	HUMIC LITHIC DYSTRUDEPT	636508	4895415	E	10_30	BLB	1859
C22	HUMUS LITHIC EUTRUDEPTS	637193	4896902	N	10_30	BEF	1595
C23	LITHIC UDORTHENT	637269	4896840	N	10_30	CON	1609
C24	TYPIC UDORTHENT	635890.9	4895224	W	10_30	BLB	1901
C25	LITHIC HAPLUDOLL	636683.6	4895828	N	0_10	GS	1752
C27	LITHIC EUTRUDEPT	637234.1	4896925	N	10_30	CON	1609
C28	TYPIC UDORTHENT	637165	4896781	N	10_30	CON	1553
C3	TYPIC UDORTHENT	637557	4896855	E	10_30	BEF	1700
C31	TYPIC UDORTHENT	636641.4	4895889	S	0_10	BLB	1766
C4	LITHIC CRYORTHENT	635826	4895003	W	30_50	GS	2027
C5	LITHIC DYSTRUDEPT	635892	4895230	W	30_50	BLB	1939
C6	LITHIC DYSTRUDEPT	635763	4895302	W	10_30	BLB	1901
C7	TYPIC UDORTHENT	637031	4895722	E	30_50	GS	1771
C8	HUMIC LITHIC DYSTRUDEPT	636391	4895641	N	10_30	BLB	1846
C9	HUMIC LITHIC DYSTRUDEPT	636549	4895939	E	10_30	BLB	1802
D60	TYPIC DYSTRUDEPTS	618341	4898077	N	0_10	BEF	1534
D61	TYPIC DYSTRUDEPTS	618311	4898094	N	>50	BEF	1497
D62	TYPIC DYSTRUDEPTS	618558	4898111	N	0_10	BEF	1473
D63	TYPIC DYSTRUDEPTS	618491	4898090	N	0_10	BEF	1488

E50	TYPIC DYSTRUDEPTS	641818	4889485	N	10_30	BEF	1532
E51	TYPIC DYSTRUDEPTS	641876	4889540	N	10_30	BEF	1507
E52	TYPIC DYSTRUDEPTS	641912	4889384	E	10_30	CON	1547
E53	TYPIC DYSTRUDEPTS	641930	48893350	E	10_30	CON	1521
E54	TYPIC DYSTRUDEPTS	642127	4889180	N	10_30	BEF	1501
E55	TYPIC DYSTRUDEPTS	642158	4889219	N	10_30	CON	1494
F1	TYPIC EUTRUDEPT	689825	4910378	S	10_30	MF	500
F2	OXYAQUIC DYSTRUDEPT	689329	4910183	E	10_30	CHE	586
F4	LITHIC EUTRUDEPT	683221	4918269	S	10_30	MF	407
G1	TYPIC DYSTRUDEPT	656622	4889282	N	10_30	CHE	560
G10	TYPIC DYSTRUDEPT	656543	4889321	N	10_30	CHE	590
G11	TYPIC DYSTRUDEPT	656534	4889320	N	10_30	CHE	589
G12	TYPIC DYSTRUDEPT	656525	4889319	N	10_30	CHE	587
G13	TYPIC DYSTRUDEPT	656515	4889317	W	10_30	CHE	586
G14	TYPIC DYSTRUDEPT	656505	4889316	W	10_30	CHE	584
G15	TYPIC DYSTRUDEPT	656495	4889313	W	10_30	CHE	580
G16	TYPIC DYSTRUDEPT	656531	4889309	N	10_30	CHE	597
G17	TYPIC DYSTRUDEPT	656526	4889305	N	10_30	CHE	604
G18	TYPIC DYSTRUDEPT	656514	4889300	N	0_10	CHE	600
G19	TYPIC DYSTRUDEPT	656623	4889270	W	10_30	CHE	605
G2	TYPIC DYSTRUDEPT	656653	4889226	N	10_30	CHE	600
G20	TYPIC DYSTRUDEPT	656643	4889256	W	10_30	CHE	610
G21	TYPIC DYSTRUDEPT	656638	4889275	N	10_30	CHE	618
G22	TYPIC DYSTRUDEPT	656680	4889190	N	10_30	MF	620
G23	TYPIC DYSTRUDEPT	656683	4889178	N	10_30	MF	625
G24	TYPIC DYSTRUDEPT	656681	4889198	N	10_30	MF	616
G25	TYPIC DYSTRUDEPT	656560	4889180	N	10_30	CHE	590
G26	TYPIC DYSTRUDEPT	656570	4889189	N	0_10	CHE	587
G27	TYPIC DYSTRUDEPT	656594	4889203	N	10_30	CHE	585
G3	LITHIC DYSTRUDEPT	656617	4889278	W	0_10	CHE	660
G5	TYPIC DYSTRUDEPT	656549	4889348	W	30_50	CHE	587
L1	TYPIC DYSTRUDEPT	687768	4904803	N	0_10	CHE	654
L10	TYPIC DYSTRUDEPT	686249	4904766	E	30_50	CHE	631
L11	LITHIC DYSTRUDEPT	686780	4904186	N	10_30	CHE	610
L12	LITHIC DYSTRUDEPT	686770	4904202	N	10_30	CHE	606
L13	LITHIC DYSTRUDEPT	686771	4904251	N	30_50	CHE	621
L14	LITHIC DYSTRUDEPT	686736	4904188	N	10_30	CHE	608
L3	TYPIC DYSTRUDEPT	685550	4904799	S	30_50	MF	692
L4	TYPIC DYSTRUDEPT	679749	4905996	W	10_30	CHE	550
L9	TYPIC DYSTRUDEPT	686233	4904761	E	30_50	CHE	637
M12	LITHIC EUTRUDEPT	686059	4901709	E	>50	MF	774
M13	LITHIC DYSTRUDEPT	686877	4900905	S	30_50	MF	890
M14	LITHIC UDORTHENT	686059	4898374	N	30_50	CHE	825
M15	LITHIC EUTRUDEPT	685826	4898658	E	>50	MF	815
M16	LITHIC UDORTHENT	683735	4898335	S	30_50	MF	782
M17	OXYAQUIC DYSTRUDEPT	685598	4899918	W	10_30	CHE	812
M18	OXYAQUIC DYSTRUDEPT	683838	4896206	N	10_30	CHE	878
M19	TYPIC EUTRUDEPT	682495	4900338	S	30_50	MF	678
M20	OXYAQUIC DYSTRUDEPT	683482	4901123	E	10_30	MF	733

M21	TYPIC DYSTRUDEPTS	685387	4894525	N	10_30	BEF	1228
M22	LITHIC EUTRUDEPT	686943	4901411	E	>50	MF	845
M3	TYPIC DYSTRUDEPT	690027	4898707	S	30_50	CHE	721
M30	LITHIC UDORTHENT	685236	4893378	E	10_30	BEF	1155
M31	LITHIC EUTRUDEPT	685511	4894770	S	10_30	CON	1196
M33	LITHIC EUTRUDEPT	684784	4893691	W	10_30	CON	1250
M34	LITHIC UDORTHENT	684960	4893501	E	10_30	BEF	1305
M35	LITHIC UDORTHENT	687733	4901915	S	10_30	MF	715
M4	TYPIC DYSTRUDEPT	690016	4898702	S	30_50	CHE	716
M43	LITHIC UDORTHENT	683455	4894598	W	10_30	CHE	919
M45	HUMUS LITHIC EUTRUDEPTS	683498	4894574	N	10_30	CON	935
M5	TYPIC DYSTRUDEPT	690015	4898699	S	30_50	CHE	716
M6	LITHIC DYSTRUDEPT	689880	4898803	N	10_30	CHE	697
M7	LITHIC DYSTRUDEPT	689775	4898809	N	30_50	CHE	687
M8	LITHIC DYSTRUDEPT	689778	4898812	N	30_50	CHE	688
P10	HUMIC LITHIC DYSTRUDEPT	603618	4905142	E	>50	BEF	1641
P11	TYPIC DYSTRUDEPTS	610279	4904365	S	30_50	BEF	1500
P3	TYPIC HAPLORTHOD	610899	4901939	N	10_30	BLB	1750
P4	TYPIC HAPLORTHOD	610157	4902367	N	30_50	BLB	1730
P6	HUMIC LITHIC DYSTRUDEPT	610157	4902367	N	30_50	BEF	1700
P8	HUMIC DYSTRUDEPT	603598	4905172	E	30_50	BLB	1652
R10	(SPODIC) LITHIC DYSTRUDEPT	645670	4888404	N	30_50	BEF	1424
R11	TYPIC DYSTRUDEPTS	646303	4887097	N	0_10	BLB	1877
R12	LITHIC DYSTRUDEPT	646082	4887343	N	10_30	BLB	1788
R2	LITHIC HAPLUDOLL	646634	4888022	W	10_30	GS	1729
R3	HUMIC LITHIC DYSTRUDEPT	646498	4888068	W	10_30	CON	1681
R4	(SPODIC) LITHIC DYSTRUDEPT	646356	4887858	W	>50	BEF	1607
R5	LITHIC HAPLOHUMODS	645373	4887519	W	>50	BEF	1596
R6	LITHIC DYSTRUDEPT	645388	4889537	W	30_50	CON	1231
R7	HUMIC LITHIC DYSTRUDEPT	645484	4889538	N	10_30	BEF	1254
R8	HUMUS LITHIC EUTRUDEPTS	653544	4889473	N	10_30	CON	1038
R9	HUMUS LITHIC EUTRUDEPTS	653384	4889232	W	30_50	BEF	970
T11	LITHIC EUTRUDEPT	671309	4903609	W	30_50	MF	506
T4	LITHIC UDORTHENT	672063	4902913	S	30_50	MF	595
T5	TYPIC UDORTHENT	672073	4903654	N	10_30	MF	625
U25	TYPIC UDORTHENT	659049	4916723	S	0_10	CHE	640
U26	TYPIC UDORTHENT	659072	4916758	N	0_10	CHE	647
U27	TYPIC UDORTHENT	659089	4916773	N	30_50	CHE	643
U28	TYPIC UDORTHENT	658831	4916463	N	30_50	CHE	608
U29	TYPIC UDORTHENT	658828	4916468	W	>50	CHE	631
U30	TYPIC UDORTHENT	658899	4916518	N	10_30	CHE	598
U31	TYPIC UDORTHENT	658815	4916497	N	30_50	CHE	615
V1	TYPIC DYSTRUDEPT	617920	4926380	W	30_50	CHE	744
V19	TYPIC DYSTRUDEPT	618243	4926952	N	10_30	CHE	793
V2	TYPIC DYSTRUDEPT	617920	4926380	W	10_30	CHE	734
V20	TYPIC DYSTRUDEPT	618265	4926959	E	10_30	CHE	745
V21	TYPIC DYSTRUDEPT	618330	4926980	E	30_50	CHE	700
V22	TYPIC DYSTRUDEPT	618338	4927058	E	30_50	CHE	685
V23	TYPIC DYSTRUDEPT	618335	4927073	E	30_50	CHE	686

V24	TYPIC DYSTRUDEPT		618160	4927154	E	30_50	CHE	719								

CON = coniferous forest, BEF = beech forest, BLB = blueberry habitats, CHE = chestnut stands, MF = mixed forest, GS = grassland.

Table S2. Monthly and yearly mean air temperatures and cumulative precipitation.

Climatic station	Altitude m a.s.l.	Coordinates		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Monte Cimone	2173	Lat 44°20′N	T °C	-3.2	-3.3	-1.4	0.1	5	9.2	11.8	12.1	7.3	4.6	0.1	-2.7	3.3
		Long 10°70′E	P mm	72	56	166	152	126	64	23	16	36	73	104	76	964
Passo delle Radici	1535	Lat 44°21′N	T °C	0.2	0.6	2.9	6.4	10.3	14.2	16,5	16.5	12.3	8.6	4.3	1.3	7.8
		Long 10°49′E	P mm	108	131	129	160	119	101	55	69	133	216	266	216	1703
Pian di Balestra	1040	Lat 44°21′N	T °C	0.4	1.8	4.8	8.8	12.8	17.2	19.9	19.5	15.1	10.7	5.7	1.9	9,9
		Long 11°14′ E	P mm	128	138	125	128	110	90	43	58	106	162	200	158	1446
Passo del Giogo	887	Lat 44°06′N	T °C	0.7	1.5	3.8	7.3	11.8	15.5	18.5	18.3	14.9	10.1	5.4	2.1	9.2
		Long 11°24′E	P mm	55	83	88	99	82	68	44	59	97	114	145	119	1083
Monghidoro	841	Lat 44°13′N	T °C	0.8	2.2	5.2	9.2	13.2	17.6	20.3	20	16.4	11.1	6.1	2.3	10.4
		Long 11°19′E	P mm	96	95	95	99	95	80	37	58	86	118	136	118	1113
Pievepelago	761	Lat 44°12′N	T °C	0.3	0.5	3.8	7.6	11.7	16.2	18.3	18.3	13.9	10.2	5.2	1.5	8.9
		Long 10°37′E	P mm	92	95	103	142	137	109	85	77	128	163	169	115	1415
Farneta	703	Lat 44°35′N	T °C	1.3	2	5.3	9	13.3	17.3	19.6	18.9	14.2	10.2	5.5	2	9.9
		Long 10'57′E	P mm	52	62	76	99	88	77	52	61	91	106	126	102	991
Monzuno	589	Lat 44°28′ N	T °C	3.8	4.7	8.4	11.8	16.4	20.6	23.2	23.4	18.2	13.4	8.3	4.6	13.1
		Long 11°27′N	P mm	52	59	7.1	95	89	77	51	61	92	115	136	91	988
Porretta	352	Lat 44°09′N	T °C	3.1	4.2	7.9	11.3	15.2	19.9	22.8	22.7	17,3	13,1	7,7	4,1	12.4
		Long 10°58′ E	P mm	80	93	94	91	83	70	46	54	77	111	128	105	1032
Sasso Marconi	275	Lat 44°44′ N	T °C	4.4	6.1	9.9	13.7	18.4	22.6	25.3	25.2	20.1	15.1	9.3	5	14.6
		Long 11°24′ E	P mm	40	60	61	75	70	65	36	46	72	81	90	58	753