

Appendix I. Process steps of vineyard management for working time recordings.

Code	Process Steps
100	Winter pruning
101	Mechanical pruning
102	Manual main pruning without frost shoots
103	Manual main pruning with frost shoots
104	Pneumatic/electric main pruning without frost shoots
105	Pneumatic/electric main pruning with frost shoots
106	Manual removal of old canes without frost shoots
107	Manual removal of old canes with frost shoots
108	Mechanical removal of old canes
109	Fastening and shortening of frost shoots
110	Chopping of old canes
111	Removal of old canes from the vineyard
200	Tying
201	Tying—one cane/ half arch
202	Tying—one cane/ flat arch
203	Tying—two canes/ half arch
204	Tying—two canes/ flat arch
300	Shoot thinning—removal of excessive shoots
301	Shoot thinning on the trunk manually
302	Shoot thinning on the trunk mechanically
303	Shoot thinning chemically
304	Shoot thinning near the head and along the canes - manually
400	Lowering the wires
401	Lowering the wires manually
402	Lowering the wires mechanically
500	Shoot positioning
501	Shoot position manually
502	Shoot positioning manually with wire spreaders
503	Shoot positioning mechanically
504	Removal of strings with reel on tractor
600	Trimming
601	Trimming mechanically
602	Trimming manually using hedge trimmers
700	Defoliation
701	Manual defoliation one-sided
702	Manual defoliation two-sided
703	Removal of first three leaves by hand
704	Defoliation with plucking machinery one-sided
705	Defoliation with plucking machinery two-sided
706	Defoliation with blowing machinery one-sided
707	Defoliation with blowing machinery two-sided
800	Yield regulation
801	Halving of compact clusters
802	Halving of all clusters
803	Removal of all grape clusters but one
804	Loosening up of clenched clusters
805	Removal of avarice grapes
806	Yield regulation applying phytohormones
807	Darwin brush
808	Selective removal of whole grapes

Code	Process Steps
900	Harvesting
901	Negative selection by hand (e.g., before harvester)
902	Pre-harvesting by hand
903	Main harvesting by hand
904	Main harvesting by standard harvester
905	Main harvesting by steep slope harvester
1000	Pest control
1001	Standard narrow track tractor
1002	Crawler tractor without winch
1003	Crawler tractor with winch/Steep slope mechanisation system with winch
1004	Helicopter
1005	Hose
1006	Ampoules with pheromones
1100	Fertilisation with mineral fertilisers
1101	Fertilisation mineral—0.1–0.2 t/ha
1102	Fertilisation mineral—0.3–0.5 t/ha
1103	Fertilisation mineral—1.0 t/ha
1200	Fertilisation with organic material
1201	Fertilisation organic—20 m ³ /ha
1202	Fertilisation organic—40 m ³ /ha
1203	Fertilisation organic—60 m ³ /ha
1300	Cultivation
1301	Ripper/disc harrow
1302	Rotary hoe/rotary harrow
1303	Deep plough
1400	Cover crop management
1401	Sowing of cover crops
1402	Mulching or milling of cover crops
1403	Mowing of edges by mulcher
1404	Mowing of edges by motor scythe
1405	Mowing of trenches by mulcher
1406	Mowing of trenches by motor scythe
1407	Mowing of embankments by mulcher
1408	Mowing of embankments by motor scythe
1500	Under-vine cultivation
1501	Plough blade
1502	Intermediate axle disc plough
1503	Intermediate axis rolling hoe
1504	Hoe (manually)
1505	Motor scythe
1600	Chemical weed control
1601	Manually by hump sprayer
1602	Mechanically
1700	Straw application
1800	Planting of missing vines
1801	Planting of the vines in existing plantation
1802	Hoeing
1803	Shoot thinning
1804	Tying
1900	New planting
1901	Removal of old plantation

Code	Process Steps
1902	Preparation of the soil
1903	Planting preparation and planting
1904	Construction of supporting system
1905	Vine care first year
1906	Vine care second year
1907	Soil cultivation
1908	Weed control
1909	Pest control
1910	Fertilisation
2000	Maintenance training system
2100	Irrigation
2101	Installation of irrigation system
2102	Irrigation
2103	Maintenance of irrigation system

Appendix II. Detailed information on the sampled sites.

Site Type		Variety	Row Distance in m	Plant Distance in m	Planting Year*
1 Standard	1	Riesling	2.0	1.2	2007
	2	Riesling	2.0	1.2	2009
	3	Riesling	2.0	1.2	1988
	4	Silvaner	2.0	1.2	2008
	5	Müller-Thurgau	2.0	1.2	1989
	6	Pinot Gris	2.0	1.1	2003/2013
2a SSH	1	Riesling	2.0	1.2	2009
	2	Riesling	1.7	1.2	1992
	3	Pinot Noir	2.0	1.0	2012
	4	Riesling	2.0	1.2	2005
2b Rope	1	Riesling	2.0	1.2	2004/2005
	2	Riesling	2.0	1.1	2010
	3	Riesling	2.0	1.2	1998/2005
	4	Riesling	2.0	1.3	2004/1990
	5	Riesling	2.0	1.2	2002
	6	Riesling	2.5	1.2	1996
	7	Riesling	2.0	1.2	1995
	8	Pinot Blanc	2.0	1.2	1993
	9	Silvaner	1.6	1.4	1992/1994
	10	Riesling	1.6	1.0	1993
2c TT	1	Pinot Noir	2.1	1.1	2012
	2	Pinot Noir	3.5	0.8	1998
	3	Riesling	1.6	1.0	2014
3 Manual	1	Riesling	2.0	1.4	1998/2005
	2	Pinot Noir	1.4	1.0	1992
	3	Riesling	1.8	1.0	1987
	4	Pinot Noir	1.5	1.2	1979
	5	Riesling	2.5	0.8	2009

* in some cases, one site consists of two parts, which were planted in different years