SUPPLEMENTARY DATA
Damian Martin, Franzi Grab, Claire Grose, Lily Stuart, Claire Scofield, Andrew McLachlan and Tanya Rutan Lin (2020).
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OENO One, *54*(4). https://doi.org/10.20870/oeno-one.2020.54.4.4021

FIGURE S1. Locations of the New Zealand Pinot noir Ideotype Vine study vineyards in Wairarapa, Marlborough and Otago.

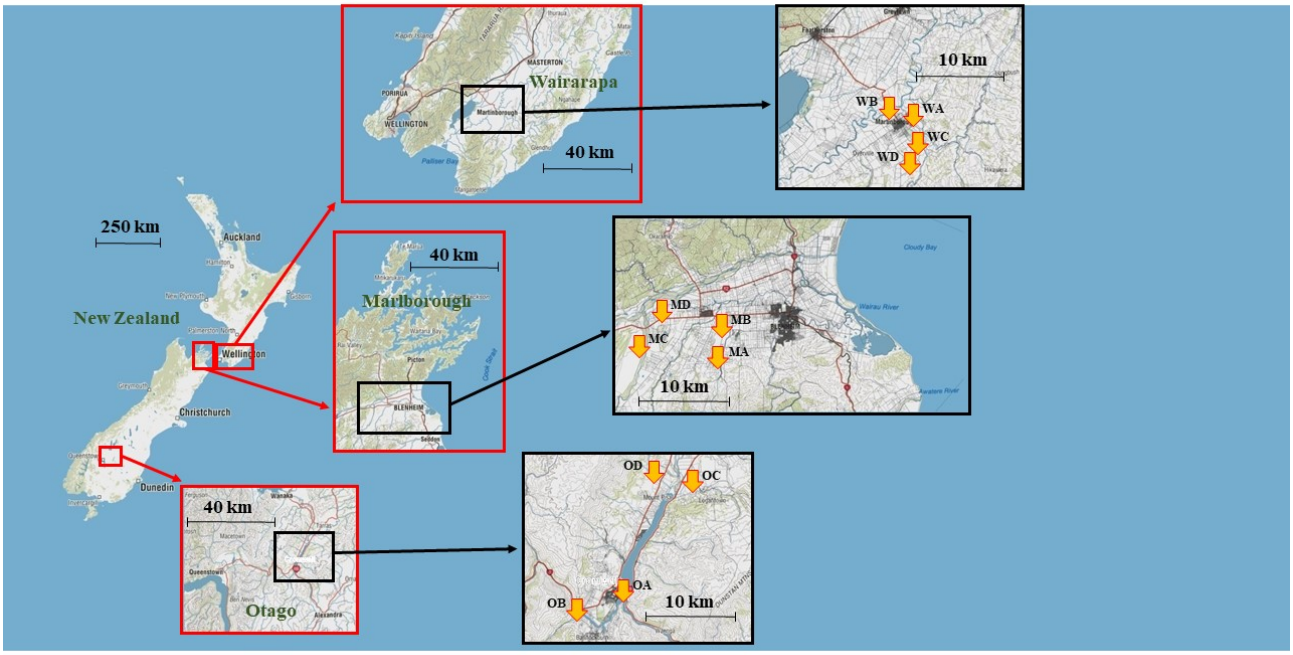


TABLE S1. Location, weather station and soil information for the New Zealand Pinot noir Ideotype Vine study network.

Vineyard ID	Region	Regional Weather Station	Local Weather Station	Sub region	Latitude	Longitude	Altitude (m)	New Zealand Soil Order
OA	Otago	Cromwell	VSCN	Bannockburn	-45.05479	169.20791	202	Manuherikiaf (Sib 1)
OB	Otago	Cromwell	Cromwell	Bannockburn	-45.07407	169.13059	263	Waengaf (Sib4)
OC	Otago	Cromwell	VCSN	Bendigo	-44.92808	169.33302	240	Ranfurlyf (Sib4)
OD	Otago	Cromwell	VCSN	Pisa Range	-44.91607	169.27075	266	Ardgouf (sib 9)
MA	Marlborough	Blenheim	VCSN	Brancott	-41.57594	173.84373	113	Renwickf (Sib 1)
MB	Marlborough	Blenheim	Brancott	Brancott	-41.53903	173.85248	49	Renwickf (Sib 1)
MC	Marlborough	Blenheim	VCSN	Wairau	-41.56289	173.72216	124	Renwickf (Sib 1)
MD	Marlborough	Blenheim	Oyster Bay	Waihopai	-41.52366	173.75809	91	Renwickf (Sib 1)
WA	Wairarapa	Martinborough	Martinborough	Martinborough	-41.21863	175.46993	48	Waimakaririf (Sib 22)
WB	Wairarapa	Martinborough	Martinborough	Martinborough	-41.21341	175.44185	20	Barrhillf (Sib 22)
WC	Wairarapa	Martinborough	VCSN	Te Muna	-41.25603	175.48724	65	Lowcliffef (Sib 5)
WD	Wairarapa	Martinborough	VCSN	Te Muna	-41.27948	175.47820	107	Lowcliffef (Sib 5)

Soil order information supplied by Landcare Research https://smap.landcareresearch.co.nz/. Abbreviation VCSN = Virtual Climate Station Network http://data.niwa.co.nz/

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TABLE S2. Vineyard block details for the New Zealand Pinot noir Ideotype Vine study network. All vineyard blocks planted with Pinot noir Abel Clone on 3309C rootstock.

Vineyard ID	Year planted	Row spacing (m)	Vine spacing (m)	Vine density	Block area (ha)	Vine number	linear row length (m)	trial zone area (ha)	% of block in trial zone
OA	2000	2.2	1.1	4,132	0.30	1,241	1,365	0.2	76%
OB	2008	1.6	0.9	6,944	0.13	917	825	0.1	64%
OC	1996	1.5	0.9	7,407	0.50	3,667	3,300	0.1	14%
OD	2008	2.4	1.5	2,778	1.56	4,333	6,500	0.4	23%
MA	1993	1.5	1.3	5,333	0.08	400	500	0.1	100%
MB	2006	3.0	1.4	2,381	0.72	1,714	2,400	0.1	19%
MC	2013	1.6	1.3	5,000	4.62	23,107	28,884	0.1	3%
MD	2005	1.8	1.2	4,831	0.75	3,637	4,182	0.1	15%
WA	2003	2.0	1.2	4,167	0.28	1,148	1,378	0.2	62%
WB	2009	2.4	1.4	2,976	0.67	1,982	2,775	0.2	27%
WC	1998	2.4	1.3	3,333	0.30	1,016	1,270	0.2	60%
WD	1999	1.6	1.2	5,208	0.95	4,954	5,945	0.2	20%

TABLE S3. Vineyard production and wine type details for the New Zealand Pinot noir Ideotype Vine study network.

Vineyard ID	Typical product type	Approx. bottle price ($NZ)	Pruning system	Training system	Target yield (kg/m)	Shoot thinning	Crop thinning	Production philosophy
OA	Icon Single Vineyard	$ 76	2-cane	VSP	1.3	Intensive	Intensive	organic/bio
OB	Icon Single Block	$ 102	2-cane	VSP	1.1	Intensive	Intensive	organic/bio
OC	Single Vineyard	$ 79	2-cane	VSP	1.1	Intensive	Intensive	organic/bio
OD	Multi-vineyard Blend	$ 28	10-spur	VSP	2.3	Light	Moderate	conventional
MA	Icon Single Vineyard	$ 63	2-cane	VSP	1.0	Intensive	Intensive	organic/bio
MB	Multi-vineyard Blend	$ 15	2-cane	VSP	2.5	Light	Light	conventional
MC	Single Vineyard	$ 20	2-cane	VSP	2.0	Light	Light	conventional
MD	Single Vineyard	$ 44	2-cane	VSP	1.1	Intensive	Intensive	organic/bio
WA	Icon Single Block	$ 80	2-cane	VSP	1.0	Intensive	Intensive	organic/bio
WB	Multi-vineyard Blend	$ 26	2-cane	VSP	1.8	Light	Light	conventional
WC	Single Vineyard	$ 52	2-cane	VSP	1.6	Light	Light	organic/bio
WD	Icon Single Vineyard	$ 140	2-cane	VSP	1.0	Intensive	Intensive	organic/bio

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DETAILED VINEYARD INFORMATION

Vineyard "OA" was planted in 2000 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented slightly West of North-South with a spacing of 2.2 m and a within-row vine spacing of 1.13 m, to give a planting density of 4,023 vines per hectare. The vines are pruned to a two-cane vertical shoot positioned (VSP) trellis with fruiting wire height of approximately 0.9 m and two sets of movable foliage wires that hold a 1.0-m tall canopy. Target yields for the vineyard are between 1.0 and 2.0 kg per vine. The vineyard soil type is classified as Manuherikia*f* (Laminar Argillic Semiarid Soil) moderately deep, well drained, loam over sandy loam https://smap.landcareresearch.co.nz/. Vineyard management practices are certified Bio Dynamic by Demeter New Zealand.

Vineyard "OB" was planted in 2008 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented North-South with a spacing of 1.6 m and a within-row vine spacing of 0.9 m, to give a planting density of 6,944 vines per hectare. The vines are pruned to a two-cane vertical shoot positioned (VSP) trellis with fruiting wire height of approximately 0.9 m and two sets of movable foliage wires that hold a 1.0-m tall canopy. Target yield for the vineyard is approximately 1.0 kg per vine per vine. The vineyard soil type is classified as Waenga*f* (Typic Argillic Semiarid Soil) shallow, moderately well drained, loam https://smap.landcareresearch.co.nz/. Vineyard management practices are certified Bio Dynamic by Demeter New Zealand.

Vineyard "OC" was planted in 1996 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented North-South with a spacing of 1.5 m and a within-row vine spacing of 0.9 m, to give a planting density of 7,407 vines per hectare. The vines are pruned to a single-cane vertical shoot positioned (VSP) trellis with fruiting wire height of approximately 0.7 m and two sets of movable foliage wires that hold a 1.0-m tall canopy. Target yield for the vineyard is approximately 1.0 kg per vine. The vineyard soils have zones of Ranfurly*f* (Typic Immature Semiarid Soil) shallow, well drained, loam and Manuherikia*f* (Laminar Argillic Semiarid Soil) moderately deep, well drained, loam over sandy loam https://smap.landcareresearch.co.nz/. Vineyard management practices are certified Bio Dynamic by Demeter New Zealand.
Vineyard "OD" was planted in 2008 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented NE-SW with a spacing of 2.4 m and a within-row vine spacing of 1.5 m, to give a planting density of 2,778 vines per hectare. The vines are spur pruned to a vertical shoot positioned (VSP) trellis with a fruiting wire height of approximately 0.9 m and three sets of movable foliage wires that hold a 1.2-m tall canopy. Target yields for the vineyard are between 3.0 and 3.5 kg per vine. The vineyard soils are classified as Ardgouf Typic Aged-argillic Semiarid Soil shallow, well drained, loam https://smap.landcareresearch.co.nz/. Vineyard management practices are accredited by Sustainable Winegrowing New Zealand®.

Vineyard "MA" was planted in 1993 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented North-South with a spacing of 1.50 m and a within-row vine spacing of 1.25 m, to give a planting density of 5,333 vines per hectare. The vines are pruned to a two-cane vertical shoot positioned (VSP) trellis with fruiting wire height of approximately 0.6 m and two pairs of movable foliage wires that hold a 1.0-m tall canopy. Target yields for the vineyard are between 1.0 and 1.5 kg per vine. The vineyard soil type is classified as Renwickf (Immature Orthic Brown Soil) https://smap.landcareresearch.co.nz/. Vineyard management practices are certified Organic by BioGro® New Zealand.
Vineyard "MB" was planted in 2006 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented North-South with a spacing of 3.00 m and a within-row vine spacing of 1.4 m, to give a

planting density of 2,381 vines per hectare. The vines are pruned to a two-cane vertical shoot positioned (VSP) trellis with fruiting wire height of approximately 0.9 m and three sets of movable foliage wires plus a fixed wire that hold a 1.2-m tall canopy. Target yields for the vineyard are between 3.0 and 3.5 kg per vine. The vineyard soil type is classified as Renwickf (Immature Orthic Brown Soil) shallow, well drained, loam https://smap.landcareresearch.co.nz/. Vineyard management practices are accredited by Sustainable Winegrowing New Zealand®.

Vineyard "MC" was planted in 2013 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented North-South with a spacing of 1.60 m and a within-row vine spacing of 1.25 m, to give a planting density of 5,000 vines per hectare. The vines are pruned to a two-cane vertical shoot positioned (VSP) trellis with fruiting wire height of approximately 0.7 m and two sets of movable foliage wires that hold a 1.1-m tall canopy. Target yields for the vineyard are between 2.0 and 2.5 kg per vine. The vineyard soil type is classified as Renwickf (Immature Orthic Brown Soil) shallow, well drained, loam https://smap.landcareresearch.co.nz/. Vineyard management practices are accredited by Sustainable Winegrowing New Zealand®.

Vineyard "MD" was planted in 2005 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented North-South with a spacing of 1.80 m and a within-row vine spacing of 1.15 m, to give a planting density of 4,831 vines per hectare. The vines are pruned to a two-cane vertical shoot positioned (VSP) trellis with fruiting wire height of approximately 0.7 m and two sets of movable foliage wires that hold a 1.1-m tall canopy. Target yields for the vineyard are between 1.0 and 2.0 kg per vine. The vineyard soil type is classified as Renwickf (Immature Orthic Brown Soil) shallow, well drained, loam https://smap.landcareresearch.co.nz/. Vineyard management practices are certified Organic by BioGro® New Zealand.

Vineyard "WA" was planted in 2003 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented NE-SW with a spacing of 2.0 m and a within-row vine spacing of 1.2 m, to give a planting density of 4,167 vines per hectare. The vines are pruned to a single-cane vertical shoot positioned (VSP) trellis with a fruiting wire height of approximately 0.7 m and two sets of movable foliage wires that hold a 1.0-m tall canopy. Target yields for the vineyard are between 1.0 and 1.5 kg per vine. The vineyard soils are classified as Barrhillf (Typic Immature Pallic Soil) moderately deep, well drained, silty loam https://smap.landcareresearch.co.nz/. Vineyard management practices are accredited by Sustainable Winegrowing New Zealand®.

Vineyard "WB" was planted in 2009 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented North-South with a spacing of 2.4 m and a within-row vine spacing of 1.4 m, to give a planting density of 2,976 vines per hectare. The vines are pruned to a two-cane vertical shoot positioned (VSP) trellis with a fruiting wire height of approximately 0.9 m and three sets of movable foliage wires that hold a 1.2-m tall canopy. Target yields for the vineyard are between 2.0 and 3.0 kg per vine. The vineyard soils have zones of Waimakaririf (Weathered Fluvial Recent Soil) deep, moderately well drained, silty loam over clay and Taitapuf (Typic Recent Gley Soil) deep, poorly drained, loam over clay https://smap.landcareresearch.co.nz/. Vineyard management practices are accredited by Sustainable Winegrowing New Zealand®.

Vineyard "WC" was planted in 1998 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented North-South with a spacing of 2.4 m and a within-row vine spacing of 1.25 m, to give a planting density of 3,333 vines per hectare. The vines are pruned to a two-cane vertical shoot positioned (VSP) trellis with a fruiting wire height of approximately 0.7 m and two sets of movable foliage wires

that hold a 1.0-m tall canopy. Target yields for the vineyard are between 1.0 and 2.0 kg per vine. The vineyard soils have zones of Lowcliffef (Mottled Argillic Pallic Soil) shallow, imperfectly drained, silty loam and Pahauf (Mottled Argillic Pallic Soil) moderately deep, imperfectly drained, silty loam https://smap.landcareresearch.co.nz/. Vineyard management practices are accredited by Sustainable Winegrowing New Zealand®.

Vineyard "WD" was planted in 1999 with Pinot noir Abel clone grafted on 3309C rootstock. The rows are oriented North-South with a spacing of 1.6 m and a within-row vine spacing of 1.2 m, to give a planting density of 5,208 vines per hectare. The vines are pruned to a two-cane vertical shoot positioned (VSP) trellis with a fruiting wire height of approximately 0.8 m and three sets of movable foliage wires that hold a 1.1-m tall canopy. Target yields for the vineyard are between 1.0 and 1.5 kg per vine. The vineyard soils are classified as Lowcliffef (Mottled Argillic Pallic Soil) shallow, imperfectly drained, silty loam https://smap.landcareresearch.co.nz/. Vineyard management practices are accredited by Sustainable Winegrowing New Zealand®.

TABLE S4. Summary climate information for the three New Zealand study regions.

		Growing season (1 September to 30 April) climate summaries						
		Tmax (ºC)	**Tmin (ºC)**	**Tmean (ºC)**	**GDD (ºC)**	**DV (ºC)**	**Rain (mm)**	**ET (mm)**
Otago	**LTA**	**20.6**	**7.3**	**14.0**	**1,060**	**13.4**	**296**	**966**
	2017/18	22.8	8.5	14.7	1,435	14.3	326	989
	2018/19	21.6	7.1	14.4	1,148	14.4	382	891
	2019/20	20.3	6.7	13.5	955	13.6	269	894
Marlborough	**LTA**	**20.4**	**9.8**	**15.1**	**1,263**	**10.5**	**393**	**854**
	2017/18	21.3	11.2	16.2	1,519	10.2	488	907
	2018/19	21.2	10.7	16.0	1,465	10.5	373	899
	2019/20	20.9	9.9	15.4	1,344	11.1	269	928
Wairarapa	**LTA**	**20.2**	**9.5**	**14.9**	**1,192**	**10.8**	**461**	**882**
	2017/18	21.0	10.6	15.3	1,423	10.3	492	874
	2018/19	20.9	10.3	15.6	1,382	10.7	462	826
	2019/20	21.0	9.8	15.4	1,350	11.1	360	910

Abbreviations LTA = Long Term Average; Tmax = mean maximum air temperature; Tmin = mean minimum air temperature; Tmean = mean air temperature; GDD = accumulated Growing Degree Days (base 10ºC); DV = Diurnal Variation; ET = Evapotranspiration.

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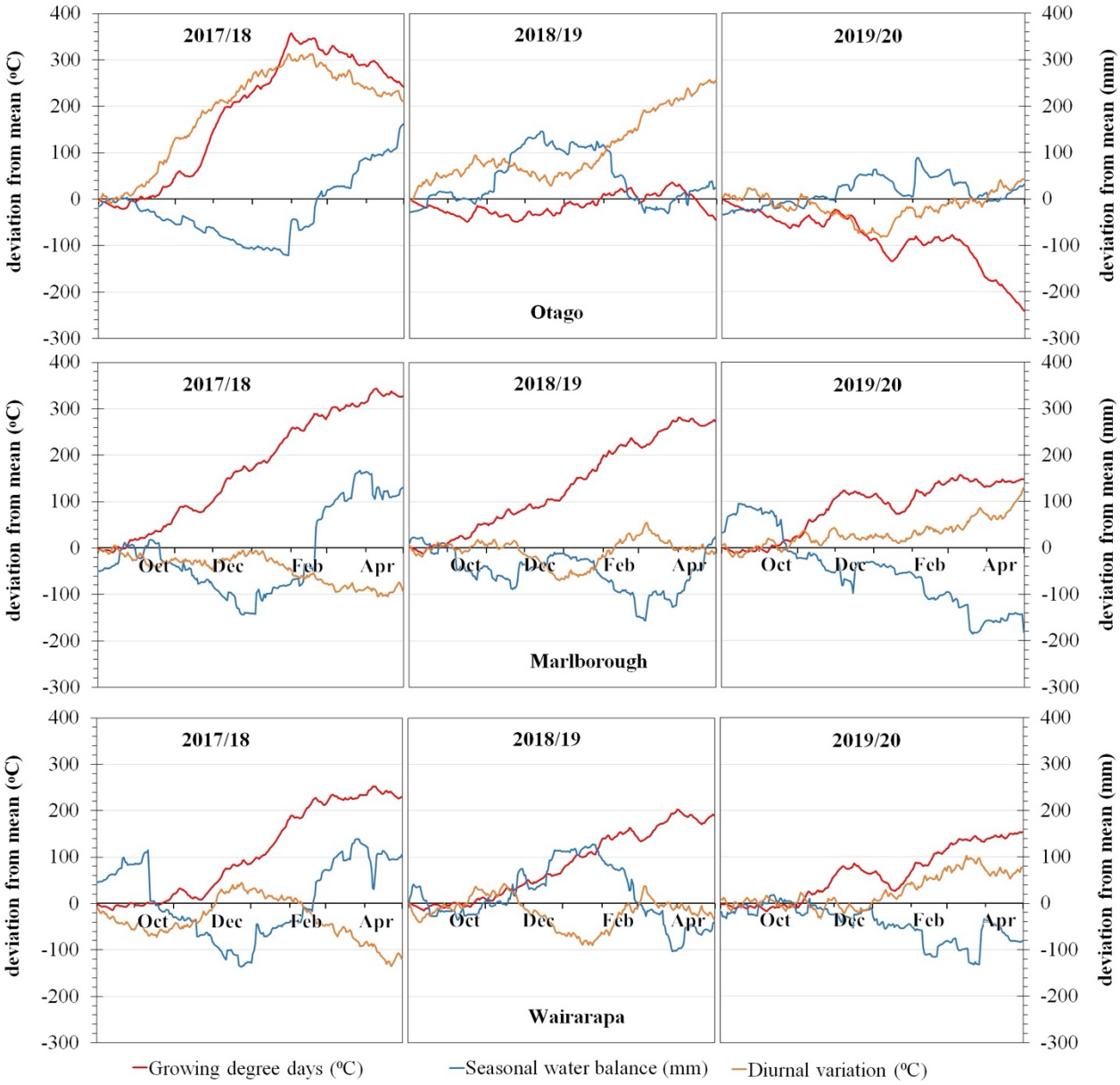


FIGURE S2. Seasonal deviations from Long term average (LTA) of Growing degree days (GDD), Seasonal water balance (SWB) and Diurnal variation (DV) in three September to April growing seasons from 2017/18 to 2019/20 in Otago (top), Marlborough (centre) and Wairarapa (bottom).



FIGURE S3. Example of the dormant canopy vine photography taken on New Zealand Pinot noir Ideotype Vine Marlborough vineyard "MD" on vine "05".
Photograph was taken on 4 July 2019 using a Nikon® D70s without flash; F-stop = f8; speed = 1/250 sec.; focal length = 16 mm

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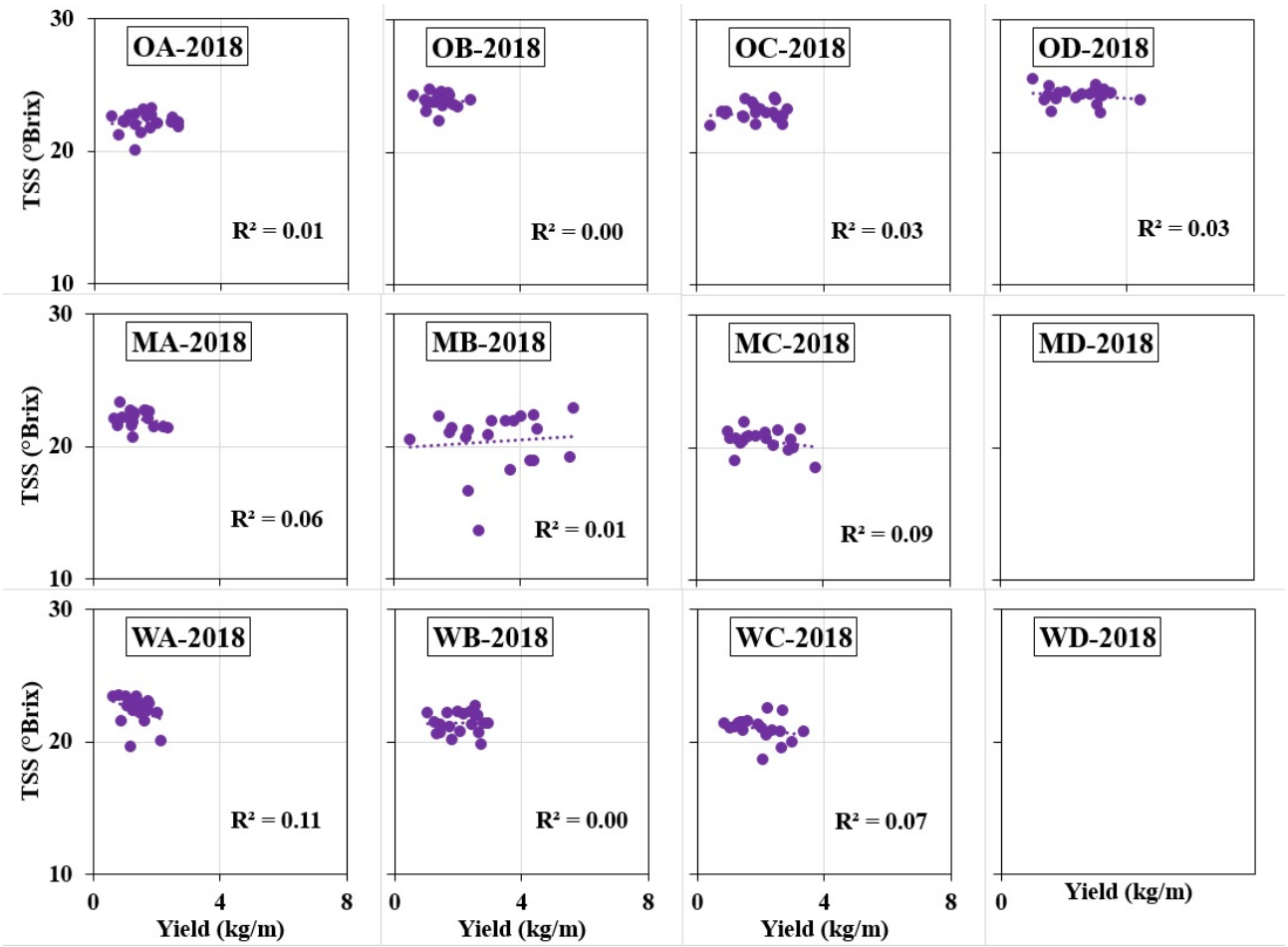


FIGURE S4. Within-vineyard relationships between yield (kg/m) and berry Total Soluble Solids (TSS) of the New Zealand Pinot noir Ideotype Vine study network in 2018.

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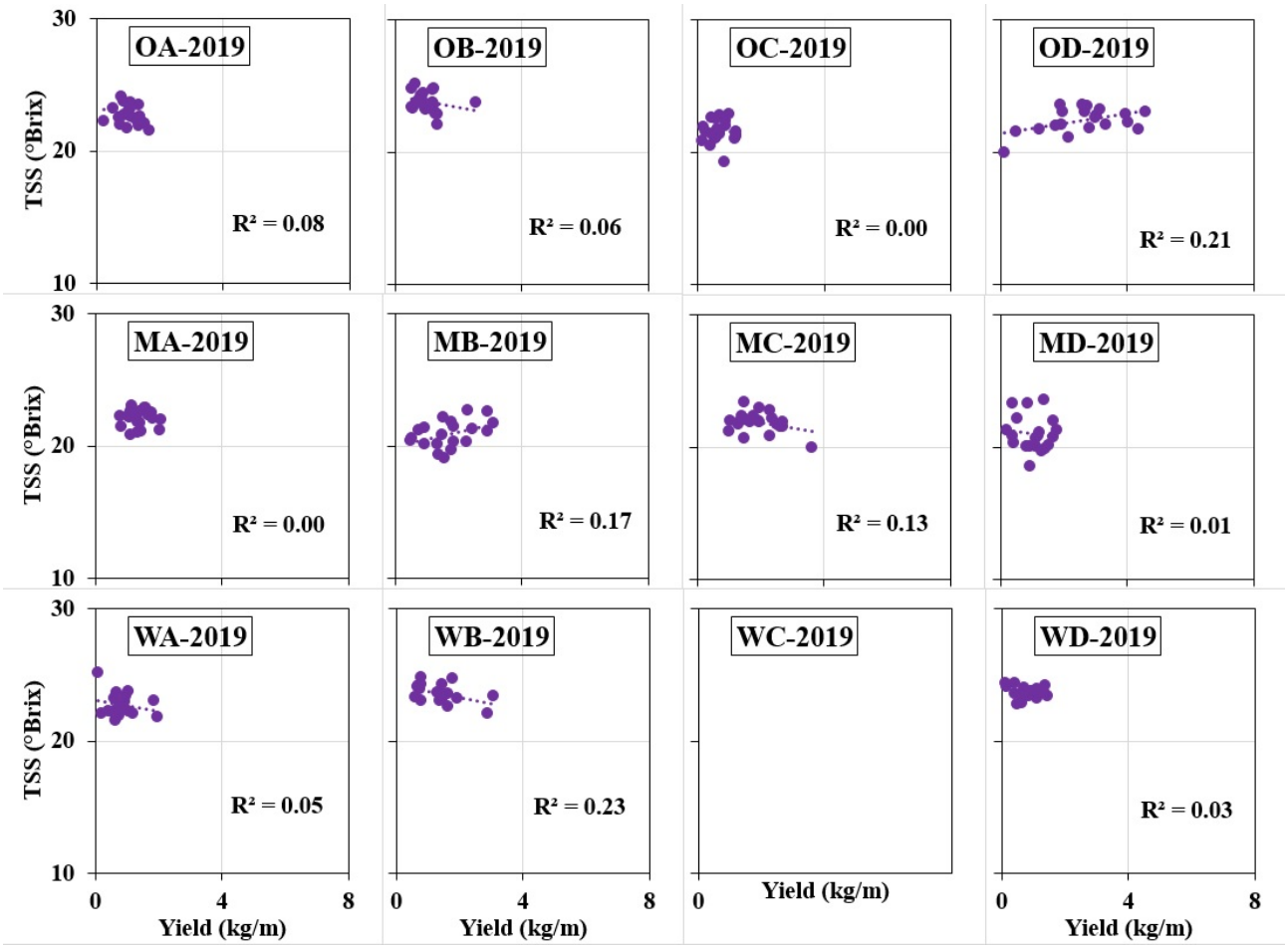


FIGURE S5. Within-vineyard relationships between yield (kg/m) and berry Total Soluble Solids (TSS) of the New Zealand Pinot noir Ideotype Vine study network in 2019.

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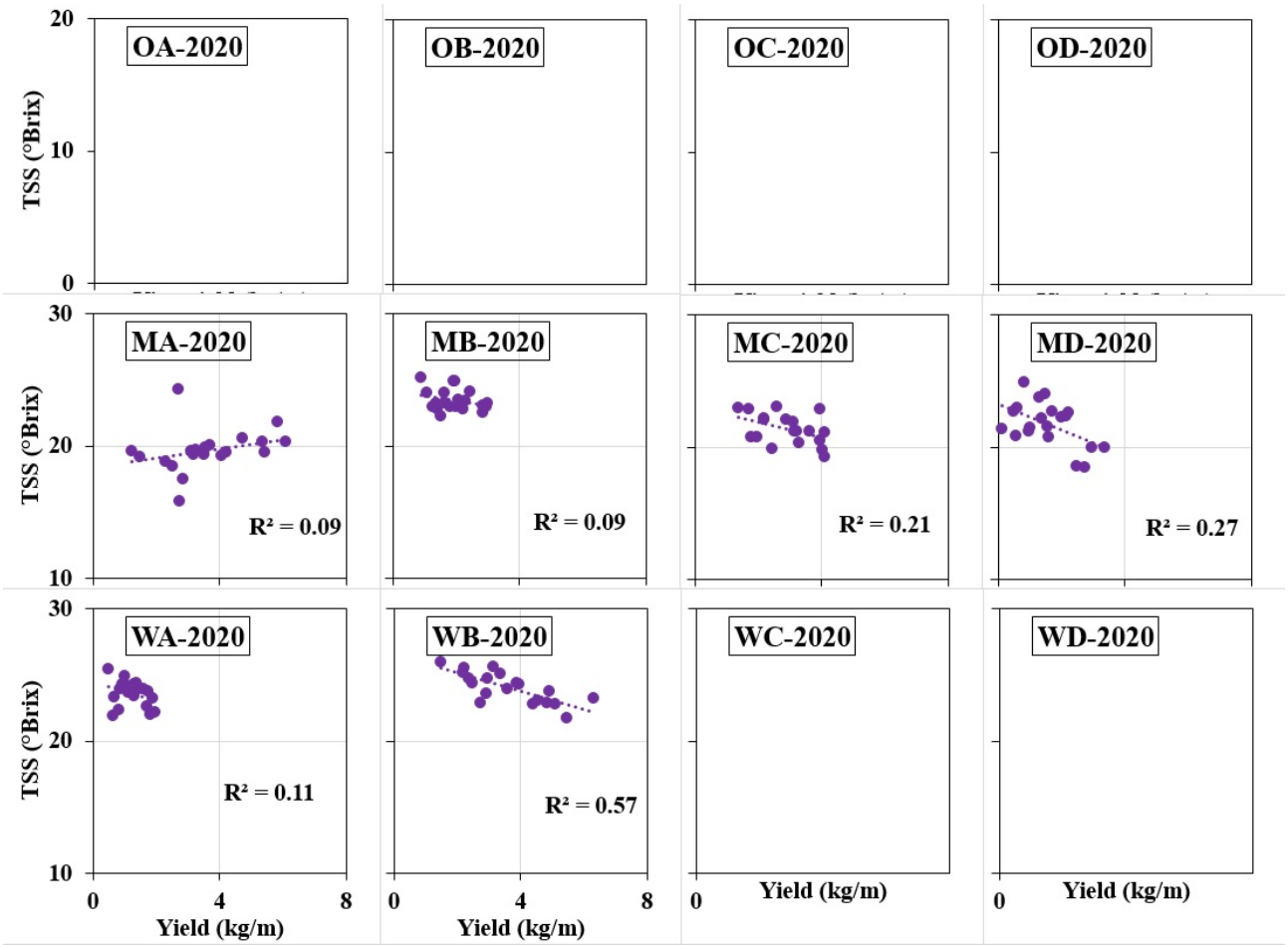


FIGURE S6. Within-vineyard relationships between yield (kg/m) and berry Total Soluble Solids (TSS) of the New Zealand Pinot noir Ideotype Vine study network in 2020.