VINEYARD FACTORS AFFECTING WINE QUALITY

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THERE ARE TWO TYPES

- ONES WE CAN CHANGE
- ONES WE CANNOT (VERY EASILY)

SITE SELECTION

REGION = CLIMATE, mainly temperature

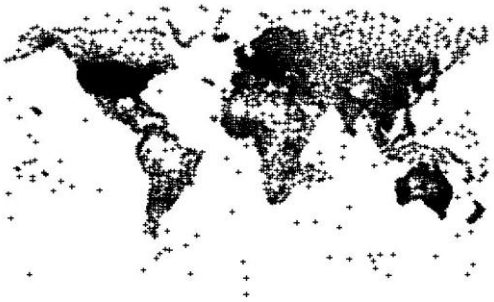
TEMPERATURE determines phenology, so rate of plant development

This in turn determines climate at critical stages, like flowering, veraison and ripening

TO WHAT EXTENT DOES CLIMATE EXPLAIN WHERE THE WORLD'S GREAT PINOTS ARE GROWN?

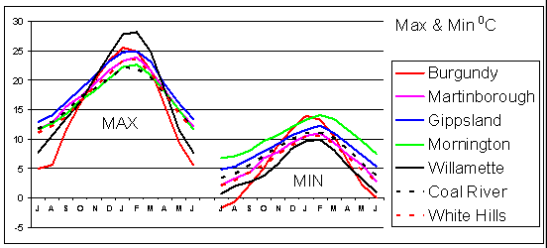
- There are only a few regions in the Old and New World with a reputation for growing great Pinot Noir
- Do they have any climate features in common? I have selected a few to examine.
- All the following graphs are presented relative to Southern Hemisphere growing season

12,300 sites world-wide available for analysis



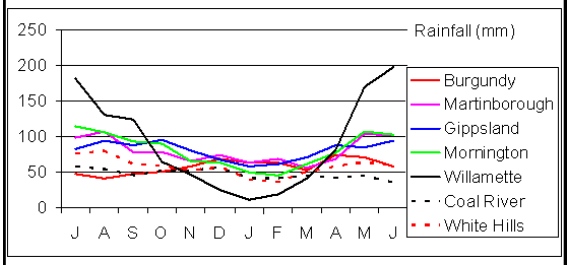
830 of these are places where grapes are grown

AVERAGE MAX AND MIN TEMPERATURES



Not at all similar

RAINFALL IS MORE SIMILAR



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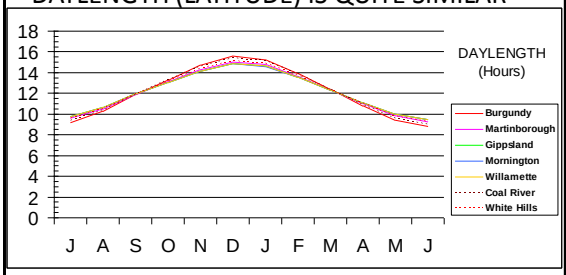
DAYLENGTH (LATITUDE) IS QUITE SIMILAR



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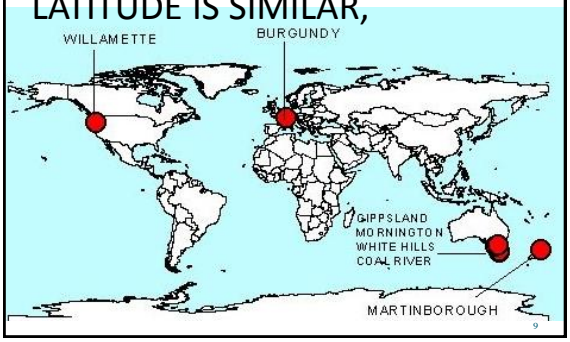
LATITUDE IS SIMILAR,



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WHERE ARE TEMPERATURE HOMOCLIMES IN AUSTRALIA AND USA?

- Using heat degree days and mean temperatures gives spurious results
- Matching maximum and minimum temperature curves is more reliable
- Can use "gridded data" for each approx 2km by 2km cell. Have data for Australia and Western USA

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BURGUNDY 8 months Max-Min matches (Sept – Apr)

Country	State/Region	Max index	Min index	Av. Index	Max match	Min match	MJT (0C)	Station
France	Dijon	0.000	0.000	0.000	Ideal	Ideal	19.8	Burgundy
France	Val de Loire	0.009	0.008	0.009	Extr. Good	Extr. Good	19.2	Bourges
Romania		0.008	0.012	0.010	Extr. Good	V.Good	19.7	Deva
Yugoslavia	Croatia	0.007	0.015	0.011	Extr. Good	V.Good	20.5	Zagreb (Agram)
Germany		0.014	0.010	0.012	V.Good	Extr. Good	19.2	Lahr
France	Val de Loire	0.016	0.009	0.013	V.Good	Extr. Good	18.9	Poitiers
Czeckoslovakia		0.016	0.011	0.014	V.Good	V.Good	20.4	Bratislava Ivanka
Hungary		0.016	0.012	0.014	V.Good	V.Good	19.5	Nagykanizsa
France	Alsace-Lorraine	0.003	0.025	0.014	Ideal	Good	19.2	Colmar-Meyenheim
Yugoslavia	Croatia	0.013	0.018	0.016	V.Good	V.Good	20.4	Slavonski
France	Val de Loire	0.010	0.021	0.016	V.Good	Good	19.5	Tours-St.Symphorien
France	Val de Loire	0.023	0.010	0.016	Good	V.Good	18.6	Orleans Saran
France	Val de Loire	0.020	0.013	0.017	Good	V.Good	18.6	Orleans Bricy
Hungary		0.010	0.032	0.021	Extr. Good	Fair	20.2	Debrecen Ap
Germany	Wurttenberg	0.021	0.022	0.021	Good	Good	18.9	Ohringen
Romania		0.011	0.037	0.024	V.Good	Fair	20.4	Oradea
Hungary	Pannonhalma-Sokorgalja	0.022	0.026	0.024	Good	Good	20.0	Gyor
Hungary		0.017	0.032	0.024	V.Good	Fair	20.4	Budapest (Ferihegy)
France	Alsace-Lorraine	0.044	0.004	0.024	Accept.	Ideal	19.1	Strasbourg/Entzheim
Germany		0.047	0.004	0.025	Accept.	Ideal	19.4	Sollingen 2
Romania		0.029	0.025	0.027	Good	Good	20.6	Arad 1
France	Champagne	0.028	0.027	0.027	Good	Good	18.9	Reims-Champagne
Hungary	Gyongyos Estate	0.023	0.033	0.028	Good	Fair	20.6	Eger
Romania		0.018	0.037	0.028	V.Good	Fair	19.5	Tigu Mures/Vidrasa
Hungary	Burgenland	0.057	0.010	0.034	Accept.	V.Good	19.4	Szombathely
Australia	NSW	0.042	0.026	0.034	Accept.	Good	19.5	Orange (agric. Inst)
Switzerland	Vaud	0.055	0.013	0.034	Accept.	V.Good	19.5	Geneva
USA	Oregon	0.045	0.025	0.035	Accept.	Good	20.1	Portland WSFO Ap
USA	Oregon	0.055	0.016	0.035	Accept.	V.Good	20.1	Portland WSFO Ap
Austria		0.049	0.022	0.036	Accept.	Good	19.8	Vienna
Australia	NSW	0.045	0.028	0.037	Accept.	Good	19.5	ORANGE AGRIC

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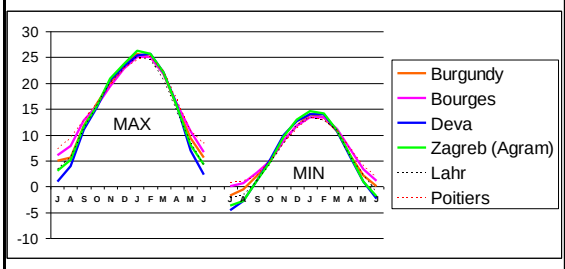
BURGUNDY 8 months Max-Min matches (Sept – Apr)



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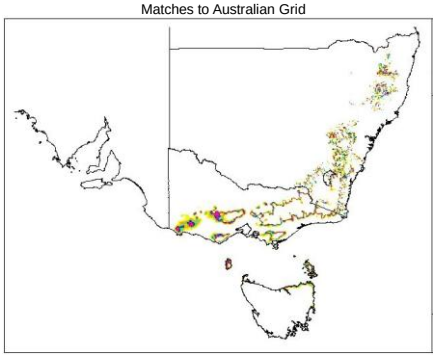
BURGUNDY 8 months cumulative HDD matches (Sept – Apr)

Matches to Australian Grid



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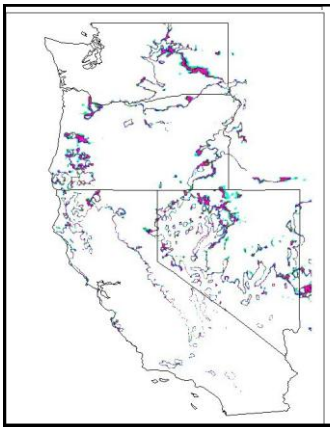

BURGUNDY WEST COAST USA 8 months Max/min matches (Sept – Apr)

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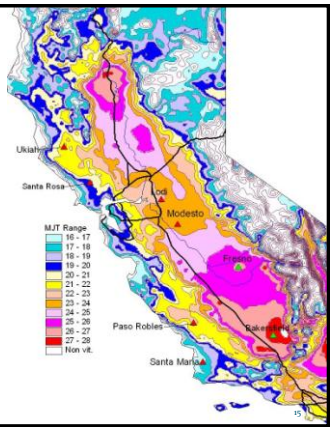
IMPACT OF GLOBAL WARMING ON CALIFORNIA

- Santa Maria 17.3 becomes Napa Co 19.3
- St Helena 21.7..Stockton 23.5
- Healdsburg 22.0..Modesto 24.4
- Modesto 24.4.. Madera 26.3
- Fresno 27.8..Bakersfield 28.8 +1



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OTHER ASPECTS OF SITE

- Cellar door location
- Soils, are never homogeneous, need moderate water holding capacity, good drainage, good irrigation

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VARIETY, CLONE, ROOTSTOCK

- How do you decide clone??
- How do you decide rootstock??

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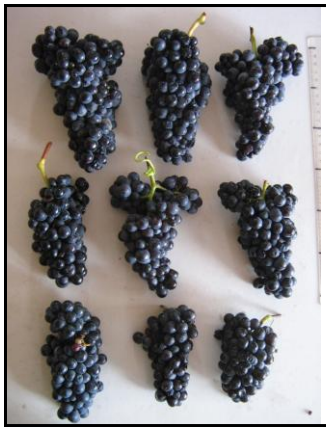

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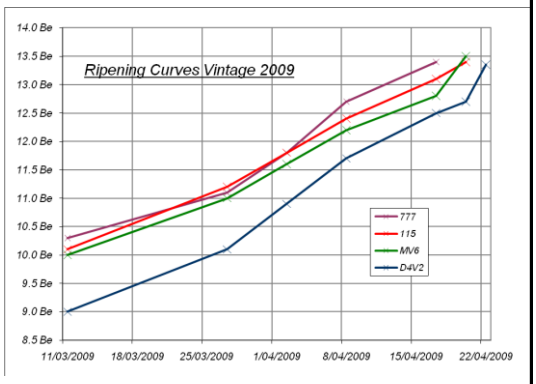
SOME STUDIES IN TASMANIA

Clones studied:

French, ENTAV 115, 392, 373, 462, 521, 583,777

Others Bests, MV6, D2V5 Wadenswil, D4V2 Pommard, D5V12 French?, G5V15 Wadenswil, G8v7 Martini



Clone	Anthocyanin ionization %	Total antho mg/L	Colour Density (au)	Colour Density SO2 corr (au)	Hue	Total Phenolics (au)	Tannin (g/L	Total pigment (au)
115 A	17.39	169.04	3.95	4.55	0.70	28.84	0.66	13.18
292 A	17.23	207.24	4.56	5.60	0.67	32.04	0.54	11.95
373 A	17.87	145.97	3.37	3.89	0.72	26.91	0.73	8.42
462 A	20.31	155.44	3.91	4.39	0.67	30.07	0.89	9.06
521 A	18.13	232.78	5.32	6.24	0.66	35.24	0.92	13.46
583 A	17.38	167.66	4.03	4.84	0.72	30.61	0.78	9.89
777 A	17.62	154.31	3.53	4.29	0.65	23.73	0.64	9.01
BEST A	17.46	174.90	3.83	4.60	0.70	32.84	0.92	9.95
D2V5 A	15.88	158.76	3.24	3.90	0.70	23.00	0.56	9.01
D4V2 A	19.49	219.34	5.72	6.60	0.65	36.29	0.96	12.60
G5V15 A	18.44	194.19	4.83	5.57	0.68	32.57	0.86	16.12
G8V7 A	14.65	289.65	5.06	6.36	0.63	37.62	0.97	4.77
MV6 A	17.67	160.43	3.60	4.25	0.71	29.87	1.04	13.46

PREFERRED CLONES

the preferred clones were D4V2, 521, 115, 462, D5V12, MV6, 292 and G5V15.

OTHER THINGS DIFFICULT TO CHANGE

Row and vine spacing

Row orientation

Post height, wire location

DIFFICULT TO CHANGE

Irrigation system, water supply

EASIER TO CHANGE, BY TRELLIS CHANGE

Capture sunlight

Avoid shade

Avoid temperature excess

WATER SUPPLY

Avoid excess water supply, do not irrigate too early

Avoid excess water stress

NUTRIENT SUPPLY

Avoid excess nutrient supply, especially nitrogen

Avoid nutrient deficiencies

OTHER

Avoid pests and diseases

Prune and thin to maintain vine balance