

Map User Notes: Table Winegrapes Suitability Map (Using Climate Futures Projections)

Summary:

The mapping aims to classify land suitable for growing Table Winegrapes (Pinot Noir and Chardonnay grapes) according to eight suitability classes: “1.0 Well suited”, “2.0 Suitable”, “2.1 Suitable (frost protection recommended)”, “2.2 Suitable (frost protection required)”, “3.0 Moderately suitable”, “3.1 Moderately suitable (frost protection recommended)”, “3.2 Moderately suitable (frost protection required)” and “4.0 Unsuitable”. These are produced from a set of pre-determined rules in accordance to a suitability matrix (refer below) developed from reviewing existing literature in conjunction with industry consultation and ground-truthing. They are based on climatic influences on Table Winegrape production using data garnered from Bureau of Meteorology weather station and DPIPWE temperature logger records collected from hundreds of site locations across the state. The mapping assumes water for crop irrigation is available and therefore not a limiting factor to production.

[Climate Futures](#) projections were incorporated into the suitability mapping framework to assess projected changes to frost risk, rainfall and growing degree days for years [2030](#) and [2050](#) (refer to [metadata](#) for more information). This compliments the current [Table Winegrapes Suitability Map](#) developed as part of the ‘[Water for Profit](#)’ program which was based on recent historical climate observations (Refer [here](#) for more information).

How is suitability determined?

The overall suitability rating is determined using a most-limiting-factor approach, where the lowest rated parameter becomes the overall suitability rating. As an example, a location may possess the following characteristics:

<u>Climate parameter</u>	<u>Threshold</u>	<u>Rating</u>
Cumulative rainfall days (March to April):	<20 days	(Well suited)
Frost risk at bud burst:	High risk	(Suitable – frost protection required)
Frost risk during harvest:	Very high	(Unsuitable)
Growing Degree Days:	>1150	(Well suited)
Overall rating:		4.0 Unsuitable

In this case, the overall suitability is classified as “4.0 Unsuitable” due to ‘*Very high (Unsuitable)*’ frost risk late in the growing season (harvest period) therefore limiting suitability due to this classification. Alternatively, if for example, frost risk (during harvest) were rated ‘*Very low (Well suited)*’, the overall rating would then revert to “2.2 Suitable (frost protection required)”, due to frost risk at bud burst rated as ‘*High risk (Suitable – frost protection required)*’ that limits the rating to this classification (refer to suitability matrix below for rule-set). As such, a “1.0 Well suited” rating is achieved if all attributes are rated at the ‘Well suited’ classification level. Note that designated conservation/protection areas as well as existing urbanised/residential zones and major waterbodies were automatically classified as “4.0 Unsuitable”.

Suitability Rule Matrix - Table Winegrapes (using Climate Futures Projections)

Rating	Rainfall: Cumulative rainfall days (>1mm) in March to April	Growing Degree Days (base temperature of 10°C, October-April)	Frost risk after budburst (<-1°C)	Frost risk during harvest in April (<-1°C)
1.0 Well Suited	<20 days	>1150	Very low risk: <1 frost per 20 year period	Very low risk: <1 frost per 20 year period
2.0 Suitable	<20 days	>1150 or 1000-1150	Low risk: between 1/20yr to 1/10yr period	Low risk: between 1/20yr to 1/10yr period
2.1 Suitable (frost protection recommended)	<20 days	>1150 or 1000-1150	Medium risk: between 1/10yr to 1/5yr period	Medium risk: between 1/10yr to 1/5yr period
2.2 Suitable (frost protection required)	<20 days	>1150 or 1000-1150	High risk: between 1/5yr to 1/2yr period	High risk: between 1/5yr to 1/2yr period
3.0 Moderately suitable	<20 days	800-1000	Very low risk - low risk: <1/10yr period	Very low risk - low risk: <1/10yr period
3.1 Moderately suitable (frost protection recommended)	<20 days	800-1000	Medium risk: between 1/10yr to 1/5yr period	Medium risk: between 1/10yr to 1/5yr period
3.2 Moderately suitable (frost protection required)	<20 days	800-1000	High risk: between 1/5yr to 1/2yr period	High risk: between 1/5yr to 1/2yr period
4.0 Unsuitable	>20 days	<800	>1/2yr per year	>1/2yr per year

Definitions of Suitability Classes (in relation to the suitability matrix)

1.0 Well suited: Land having no significant climatic limitations to sustained Table Winegrape production where risk of significant crop loss due to adverse climate conditions are unlikely.

2.0 Suitable: Land having only minor climatic limitations that will not significantly reduce productivity. Any risk of crop loss is inherently low

2.1 Suitable (frost protection recommended): Same as 2.0, however, installation of frost prevention measures are recommended due to the elevated risk of damaging frosts during post bud break and/or late in the growing season during harvest (i.e. a damaging frost every 5 years is possible during these times). Failure to install frost mitigation measures may result in reduced productivity and crop loss.

2.2 Suitable (frost protection required): Same as 2.0, however, installation of frost prevention measures are required due to the high risk of damaging frosts during post bud break and/or late in the growing season during harvest (i.e. damaging frosts may occur in 50% of years during these times). Failure to install frost mitigation measures will likely result in reduced productivity and crop loss.

3.0 Moderately suitable: Land having climatic limitations (i.e. growing degree day units indicate a cool growing season) that is likely to impact on sustained productivity where risk of poor yield or fruit quality is possible in some years. However, area may be more amendable to Sparkling winegrape production (refer here for [Sparkling winegrape suitability map](#)).

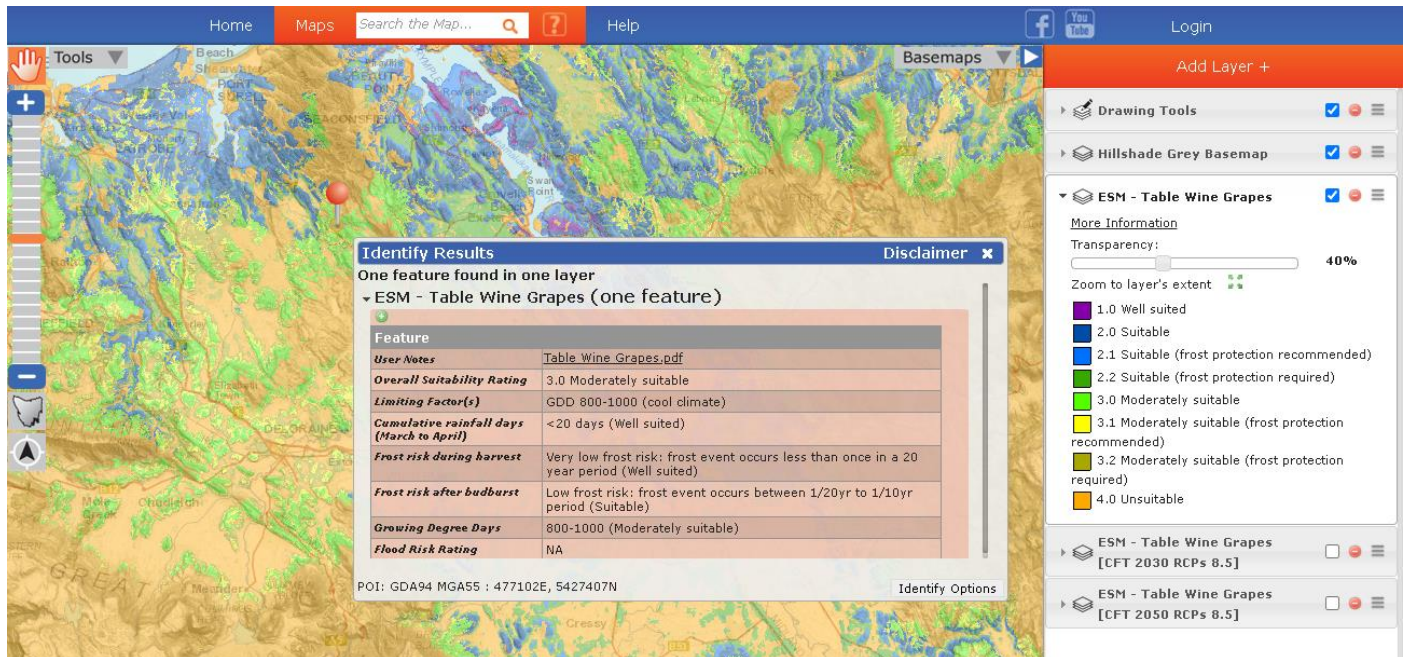
3.1 Moderately suitable (frost protection recommended): Same as 3.0, however, installation of frost prevention measures are recommended due to the elevated risk of damaging frosts during post bud break and/or late in the growing season during harvest (i.e. a damaging frost every 5 years is possible during these times). Failure to install frost mitigation measures may result in reduced productivity and crop loss.

3.2 Moderately suitable (frost protection required): Same as 3.0, however, installation of frost prevention measures are required due to the high risk of damaging frosts during post bud break and/or late in the growing season during harvest (i.e. damaging frosts may occur in 50% of years during these times). Failure to install frost mitigation measures will likely result in reduced productivity and crop loss.

4.0 Unsuitable: Land having climatic limitations which are severe for sustained Table Winegrape production and will so reduce benefits, or increase required inputs, that this expenditure may not justify. Risk of crop loss is high.

LISTmap instructions

The Table Winegrapes suitability map is a digital layer that can be manually interrogated within [LISTmap](#). Any location can be enquired within Tasmania to provide location specific parameters pertaining to Table Winegrape suitability. To interrogate a location, simply click on any location whilst the Table Winegrapes suitability layer is active in the table of contents panel and a window will appear listing important attributes. An example is given below:



The screenshot shows the LISTmap web application interface. The main map area displays a topographic map of Tasmania with a suitability layer for Table Winegrapes. A red dot indicates the location of the selected feature. An 'Identify Results' window is open, showing the following information:

Feature	
User Notes	Table_Wine_Grapes.pdf
Overall Suitability Rating	3.0 Moderately suitable
Limiting Factor(s)	GDD 800-1000 (cool climate)
Cumulative rainfall days (March to April)	<20 days (Well suited)
Frost risk during harvest	Very low frost risk: frost event occurs less than once in a 20 year period (Well suited)
Frost risk after budburst	Low frost risk: frost event occurs between 1/20yr to 1/10yr period (Suitable)
Growing Degree Days	800-1000 (Moderately suitable)
Flood Risk Rating	NA

POI: GDA94 MGA55 : 477102E, 5427407N

The window provides information such as the “Overall Suitability Rating” as well as other useful information including:

- ‘Limiting Factor(s)’ - provides a list of attributes that limits a classification to a particular suitability rating;

In addition, information pertaining to each climate attribute (according to the classifications provided in the suitability matrix on page 2) are also provided and appear below the overall suitability rating and constraint fields (as shown in the example above). This allows users to ‘drill down’ and view site-specific information regarding climate requirements that relate to Table Winegrape production for any point of interest in Tasmania.

Flood risk

Also listed within the suitability layer are categories relating to risk of flood inundation, as provided by flood plain layer within the LIST Hydrography dataset

(http://listdata.thelist.tas.gov.au/public/LIST_Hydrographic_Information.pdf).

Ratings of ‘High’, ‘Moderate’ or ‘Nil’ are listed that correspond to ‘Severe’, ‘Moderate’ or ‘Nil’ flooding potential. Note that flood risk categories are complementary material to the mapping and does not contribute to the “Overall Suitability Rating”.

References

Webb, M., Pirie, A., Kidd, D., Minasny, B. (2017) Spatial analysis of frost risk to determine viticulture suitability in Tasmania, Australia. *Australian Journal of Grape and Wine Research* **24**, 219-233.

(<https://onlinelibrary.wiley.com/doi/full/10.1111/ajgw.12314>)

Smart, R. and Wells, R. (2014) Encouraging the development of the wine sector in Tasmania (Smart Viticulture: Newlyn, England).

(http://www.utas.edu.au/_data/assets/pdf_file/0009/612639/Encouraging_Development_of_Viticulture_Final_Report_Jul101.pdf)

Additional Information

For information about using LISTmap, please consult the help document:

<http://listdata.thelist.tas.gov.au/public/outgoing/sif/listmaphelp.pdf>

For technical information relating to the dataset, please consult the [metadata](#).

For information relating to irrigation investment, please consult the Investing in Irrigation web-portal:

<http://dppw.tas.gov.au/agriculture/investing-in-irrigation>

Wine Tasmania is the peak industry body representing wine growers and information can be found here:

<http://winetasmania.com.au/>

Contact

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Caution and Disclaimer

The information and material in LISTmap (including the enterprise suitability map layer for Table Winegrapes and accompanying climate input datasets, i.e. "material") is based on computer modelling of the potential suitability of Table Winegrapes to a given area and, as such, there are inherent uncertainties in the results. While every effort has been made to ensure the material is accurate, the Crown in Right of Tasmania ("Crown") provide no warranty, guarantee or representation that the material is accurate, complete, up to date, non-infringing or fit for a particular purpose. All suitability assessments are based upon the assumption that water for crop irrigation is available and therefore is not a limiting factor. Furthermore, the Crown expressly disclaim all and any legal liability and responsibility whatsoever arising from or connected with: (a) the accuracy, reliability, validity, currency or completeness of the material; (b) the consequences of anything done or omitted to be done by any person, either in whole or in part, in reliance of the material. The material does not take into account personal circumstances. The material is made available on the understanding that the Crown are not providing professional advice and that users of this material should undertake site-specific investigations and research and obtain appropriate professional advice relevant to their particular circumstances. The relevant maps that form part of the material have been prepared at 1:50,000 scale (landscape level). These maps consider only climate constraints and do not take into account other parameters or any legislative, regulatory and/or policy requirements of Federal, State or Local Governments that apply to the land in question and/or which could affect the proposed land use or agricultural enterprise.