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Global intel

Conservation des connaissances sur le changement climatique, analyse des lacunes, création et extension d'informations: la solution VitiSynth, illustrée par les cas de risque de gel, de dommages et d'atténuation de ses effets

Climate change knowledge curation, gap analysis, insight creation and extension: The VitiSynth solution, illustrated by the cases frost risk, damage and mitigation,

James Wright, VitiSynth, Australie/ Allemagne

JOURNÉES ANNUELLES LIEN DE LA VIGNE

1er avril 2022 ASSEMBLÉE GÉNÉRALE DE L'ASSOCIATION

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James Gordon Douglas Wright
Creator & Author of VitiSynth

- *Australian, living in Germany since 2011*
- *First career- Business management consultant (200+ clients in diverse industries, 150+ seminars delivered on primarily management subjects)*
- *Second and last career- Wine industry!...*
- *Restart as a vineyard hand- getting to know what a Lyre trellis looks like*
- *Learning all operations from the ground up- trellising, pruning to machine harvesting, still doing it when I get the chance*
- *Managed a large vineyard in Langhorne Creek, South Australia*
- *Started my own consultancy company and 6 months later founded the Australian Institute of Viticulture (delivery of 100+ wine industry specific seminars on management and technical subjects)*

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VitiSynth Timeline

- *2010- first thoughts*
- *2011- creation of the first version of the database*
- *2012- first edition of VitiSynthesis sent out to mainly Australian contacts*
- *2014- further development of the database and expansion of website functionality*
- *2019- expansion of the VitiSynth Wine LoT © to include the first correlations*
- *2021- VitiSynth Correlate © launched*
- *March 2022- Database restructuring to prepare for the next generation of VitiSynth Correlate © completed*
- *November 2022- next generation of VitiSynth Correlate © planned for launch*

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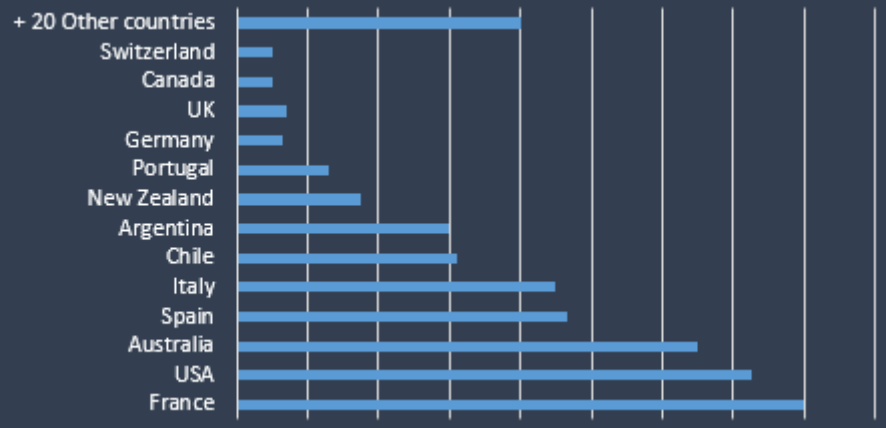
VitiSynth Today

- *VitiSynthesis distributed to 10,000+ wine professionals around the world*
- *Integrations within large wine company intranets*
- *Wine Australia providing group access for 600 industry participants*
- *Non-commercial partnerships with IVES, Vinifera Euromasters, SWGB*
- *Commercial partnerships with the American Society for Enology and Viticulture, Amorim (6 years), Erbslöh, SWAN Systems, Woodshield, ViniClip*



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VitiSynth Knowledge Curation

- *Abstracts and metadata uploaded to the VitiSynth database (all wine and table grape research from around the world, no noise!)*
- *Publications indexed using the unique, 360 degree VitiSynth Wine LoT © ontology- contains literally everything to do with wine, in context*
- *New « things » are being added to the Wine LoT © constantly- currently 375290 items, being used in 24980 interaction tables*
- *Correlations also curated in the database allowing for the generation of graphical representations*
- *VitiSynthesis sent out weekly to ensure wine professionals find out about the large volume of great research being published*

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VitiSynthesis Impact

- *Massive time savings for the global wine industry=My time X 10,000*
- *Sorting by subject and providing read recommendations saves even more time*
- *Simply making people aware of the latest research drives innovation and adaption- feeding the trend towards on site experimentation*
- *In real terms- more research is being read by practicioners*
- *Researchers worldwide are reading VitiSynthesis and taking inspiration*

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VitiSynth Correlate © Impact

- *Creates the capacity for a busy wine professional to obtain an overview of a complex system that perhaps only a specialist researcher could generate in their minds*
- *Highlights trends and potential linkages that have not been seen before*
- *Provides the capacity to understand the potential non-targeted implications of actions*
- *Preserves the legacy of research papers*

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Frost- VitiSynth database

James Wright's VitiSynth Open Access

ABSTRACTS | SYNTHS | WINE LOT | CORRELATE | SUBSCRIBE

ADVANCED INTERACTION SEARCH | Search Entries | Go!

Search for Specific Interaction & Display: ○ Interactions ○ Entries | ◉ Search across full Entry

Primary Group: // Please Select | Factor Group: // Please Select | Specific Factor (select level of specificity): // Please Select | ADD ROW | Submit

Search Results

Vitisynth Search Results for: frost

Go Back

Title	Recom.	79 Results Found.
Vintage Synth:Burgundy:2010		Read Synth
Vineyard Synth:Vineyard establishment:Cultivar selection		Read Synth
Region Synth:Northern hemisphere:Germany:Pfalz:Topography		Read Synth
Reference:Journal:AJGWR:Effect of delaying budburst on shoot development and yield of Vitis vinifera L. Chardonnay 'Mendoza' after a spring freeze event	Must Read	Read Review
Reference:Journal:VITIS:2013:52-4 p207-208:Karvonen J 2013:Does soil temperature restrict outdoor viticulture in southern Finland?		Read Review
Reference:Journal:Agricultural and Forest Entomology:2013:15-4 p398-406:Pavan F 2013:Occurrence of two different development patterns in Lobesia botrana (Lepidoptera- Tortricidae) larvae during the second generation		Read Review
Reference:Journal:AJGWR:2014:20 p160-168:Molitor D 2014:Late frost damage risk for viticulture under future climate conditions- a case study for the Luxembourgish winegrowing region	Must Read:If you are in a cold climate	Read Review
VitiSynthesis:2014:June:Week:3		Read Synth

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Frost

- *Getting the terminology right:*
  « Frost » can refer to soil frost, soil permafrost (Gelic or Non-gelic), autumn frost, winter frost or freeze?, spring frost…
- *Frost damage can refer to bud damage, shoot damage, inflorescence damage, root damage…*
- *The VitiSynth Wine LoT © defines a clear set of preferred terminology that can be used by researchers and wine professionals*

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Thresholds for secondary bud fruitfulness (VitiSynth):

Bud (compound):Secondary bud:Inflorescence:Number:01 Very low (<0.3)
Bud (compound):Secondary bud:Inflorescence:Number:02 Low (0.3-0.69)
Bud (compound):Secondary bud:Inflorescence:Number:03 Moderate (0.7-1.09)
Bud (compound):Secondary bud:Inflorescence:Number:04 High (1.1-1.49)
Bud (compound):Secondary bud:Inflorescence:Number:05 Very high (>1.49)

Classification example in VitiSynth:
Vitis:vinifera:vinifera:Chardonnay Blanc:!:03:Classifications:Vine:Bud (compound):Secondary bud:Inflorescence:Number:03 Moderate (0.7-1.09):N=1:Friend A P 2011

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Research paper examples:

https://www.vitisynth.com/Viticultural/Knowledge_Base/Reviews/Article/9488

https://www.sciencedirect.com/science/article/abs/pii/S0304423817301875

ELSEVIER

Scientia Horticulturae

Volume 219, 17 May 2017, Pages 302-309

Impact of spring freeze on yield, vine performance and fruit quality of *Vitis* interspecific hybrid Marquette

Tommaso Frioni [a], Alan Green [a], Jacob E. Emling [a], Shijan Zhuang [b], Alberto Palliotti [c], Paolo Sivilotti [d], Rachele Falchi [d, e], Paolo Sabbatini [a]

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https://doi.org/10.1016/j.scienta.2017.03.026

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Research Article

Secondary Bud Gas Exchange, Growth, and Fruitfulness of *Vitis vinifera* L. cultivars, 'Grenache' and 'Cabernet Sauvignon' Grown on the Texas High Plains

	Pruning weight (g)	Yield (g vine⁻¹)	Ravaz index	Cluster mass (g)	Cluster vine⁻¹	Berry mass (g)	TSS (ºBrix)
Treatment							
Primary buds	344.1 a	597.5 a	3.28	27.8 a	-	-	24.1 a
Secondary buds	226.2 b	287.6 b	2.18	20.6 b	-	-	21.6 b
Cultivar							
Cabernet sauvignon	357.3 a	445.6	1.53 b	15.9 b	-	-	21.6
Grenache	164.2 b	439.4	3.93 a	32.5 a	-	-	23.9
Treatment × Cultivar							
Cabernet sauvignon × primary	-	-	-	-	33.5 a	0.64 c	-
Grenache × primary	-	-	-	-	15.5 c	1.08 a	-
Cabernet sauvignon × secondary	-	-	-	-	20.1 b	0.39 d	-
Grenache × secondary	-	-	-	-	10.3 d	0.73 b	-

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Vine:Yield (t/ha):01 Extremely low (less than 2.5t/ha, 1t/acre, 0.25kg/m2, 17.5 hL/ha)
Vine:Yield (t/ha):02 Very low (between 2.5-5t/ha, 1-2t/acre, 0.25-0.5kg/m2, 17.5-35 hL/ha)
Vine:Yield (t/ha):02 Very low (between 2.5-5t/ha, 1-2t/acre, 0.25-0.5kg/m2, 17.5-35 hL/ha):I:02:Codes:OIV 504-1
Vine:Yield (t/ha):03 Low (between 5-10t/ha, 2-4t/acre, 0.5-1kg/m2, 35-70 hL/ha)
Vine:Yield (t/ha):03 Low (between 5-10t/ha, 2-4t/acre, 0.5-1kg/m2, 35-70 hL/ha):I:02:Codes:OIV 504-3
Vine:Yield (t/ha):04 Moderate (between 10-15t/ha, 4-6t/acre, 1-1.5kg/m2, 70-105 hL/ha)
Vine:Yield (t/ha):04 Moderate (between 10-15t/ha, 4-6t/acre, 1-1.5kg/m2, 70-105 hL/ha):I:02:Codes:OIV 504-5
Vine:Yield (t/ha):05 High (between 15-20t/ha, 6-8t/acre, 1.5-2kg/m2, 105-140 hL/ha)
Vine:Yield (t/ha):05 High (between 15-20t/ha, 6-8t/acre, 1.5-2kg/m2, 105-140 hL/ha):I:02:Codes:OIV 504-7
Vine:Yield (t/ha):06 Very high (between 20-30t/ha, 8-12t/acre, 2-3kg/m2, 140-210hL/ha)
Vine:Yield (t/ha):06 Very high (between 20-30t/ha, 8-12t/acre, 2-3kg/m2, 140-210hL/ha):I:02:Codes:OIV 504-9
Vine:Yield (t/ha):07 Extremely high (more than 30t/ha, 12t/acre, 3kg/m2, 210hL/ha)

Vine:Yield (t/ha):Secondary buds:01 Extremely low (less than 2.5t/ha, 1t/acre, 0.25kg/m2, 17.5 hL/ha)

OSSERVAZIONI GENERALI / REMARQUES GÉNÉRALES / ALLGEMEINE HINWEISE / GENERAL REMARKS / OBSERVACIONES GENERALES

characteristics	OIV	UPOV	IPGRI
Woody shoot: erect hairs on nodes	105		
Woody shoot: erect hairs on internodes	106		
Flower: sexual organs	151	16	6.2.1
Inflorescence: insertion of 1st inflorescence	152		
Inflorescence: number of inflorescences per shoot	153		7.1.3
Shoot: fertility of basal buds (buds 1-3)	155		
Bunch: length (peduncle excluded)	202		7.1.5

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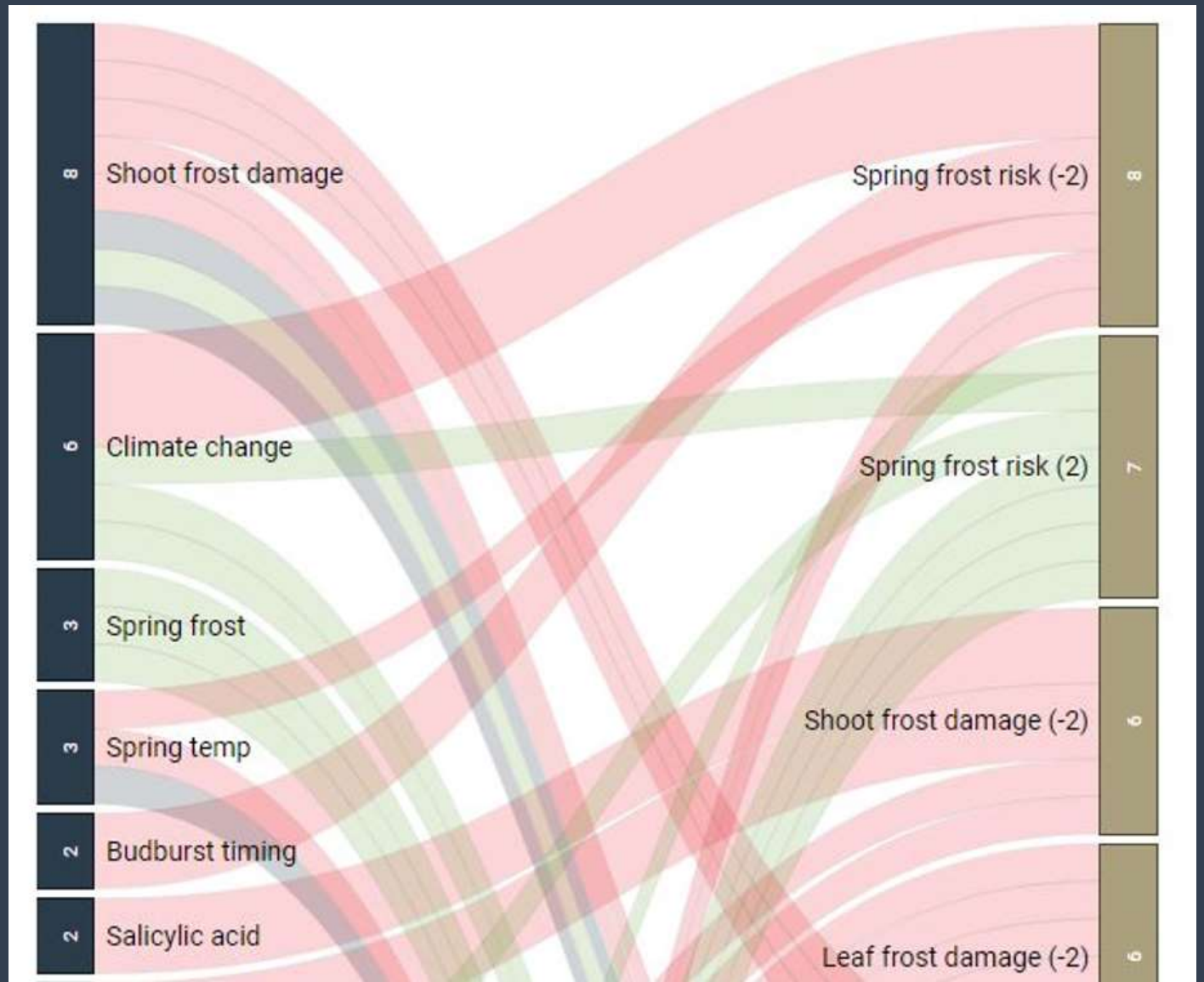
Frost- VitiSynth Correlate ©



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Frost- dealing with complex systems

Hormones:Plant hormones:Salicylic acid:!:04:Correlations:….

CorrValue=-2:Vine:Leaf:Aroma compounds:Volatile:Aldehydes:C3:Malondialdehyde:N=1:Abbasi K A 2020
CorrValue=-2:Vine:Shoot:Damage:Temperature:Cold damage:Frost damage:N=2:Ershadi A 2013, Abbasi K A 2020
CorrValue=2:Vine:Leaf:Amino acids:Alpha amino acids:Proline:N=2:Ershadi A 2013, Abbasi K A 2020
CorrValue=2:Vine:Leaf:Carbohydrates:Total soluble carbohydrates:N=2:Ershadi A 2013, Abbasi K A 2020
CorrValue=2:Vine:Resistance:Soil:Chemical:Salinity:N=1:Ekbic H B 2020

But what else does it affect? Extent of Coulure? Yield?

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Future steps

- *Ongoing development of the database and in particular VitiSynth Correlate ©*
- *Please feel free to subscribe or ask about group access for your company / institution*
- *Provision of data / analysis / graphics / climate change newsfeeds*
- *Sponsoring of access / content creation*
- *Researchers- submit your papers!*

Thank you for your time!