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► To cite this version:

Yoann Valloo, Thomas Crestey, Jean-Philippe Gras, Célia Crouzet, Bruno Tisseyre. Is it possible to use current auto steering system in viticulture?. 14. European Conference on Precision Agriculture, Jul 2023, Bologna, Italy. , 2023. <hal-05004194>

HAL Id: hal-05004194

<https://hal.science/hal-05004194v1>

Submitted on 25 Mar 2025

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Is it possible to use current auto-steering system in viticulture ?



Context



Replacing chemical weeding with mechanical weeding has several consequences in viticulture : **higher number of tractor passes, more fuel consumption, increased workload.** Moreover, inter-row mechanical weeding requires dexterity in order not to damage the vines. In this context, **retro-fitted precise (RTK-GNSS) auto-steering (AS)** on the tractor is a potential solution to improve the quality of the mechanical weeding, to reduce the driver's mental burden while being adaptable to current farm equipments. As the commercial AS systems were originally designed for arable crops, experiences with precise AS in **viticulture** have been little reported.

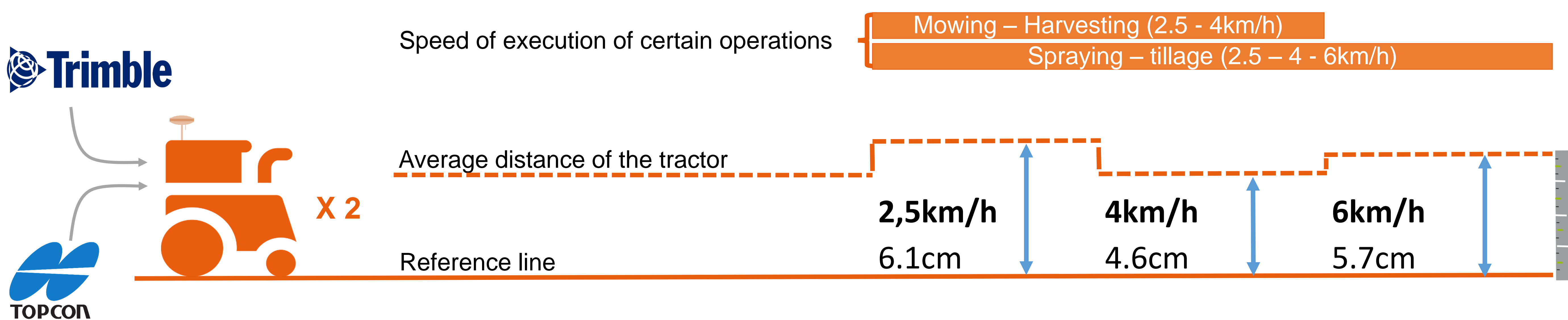
Objective : Evaluate the potential of commercial auto-steering system in viticulture



Methodology & Results

Using two commercial AS, the evaluation was made on two aspects :

- i) the spatial accuracy for all the mechanised operations in the vineyards : this was done by measuring the distance between paint marks left by the tractor.



- ii) Technical compatibility and relevance perceived regarding specific operations in viticulture according to the two tractor's drivers

Vineyard intervention	Spraying	Inter-row mowing	Mechanised harvesting	Inter-vine tillage	Inter-row tillage	Combination: inter-row and inter-vine tillage
Perceived technical compatibility	Yes 👍	Yes 👍	Maybe 🤔	Maybe 🤔	Yes 👍	Yes 👍
Perceived relevance	Low 😞 to moderate 😊	Low 😞	Moderate 😊	Moderate 😊	High 😊	High 😊

Conclusion

This work shows that AS can play an important role in viticulture. However, **since vines are grown in rows**, this limits the range of operations for which AS can be used. Moreover, these results were obtained on vines spaced 2.5 m apart; on narrower vineyards (e.g. in Burgundy, France) the constraints of AS could be even more limiting. This work will benefit the industry by clarifying the **advantages and limitations of AS** with the aim of improving the transition to mechanical weed control.



ANR Ecophyto-Maturation project (ANR-21-ECOM-0005), co-financed by the OFB via the fee for diffuse pollution under the Ecophyto plan