



Preplant cover crops affect weed and vine growth in first-year vineyards

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- Cover crops are an integral part of site preparation during vineyard establishment. Normally, a fall cover crop is established the year before vine planting, which is then cultivated into the soil to increase organic matter and improve vine growth. An alternative to *cultivating* the cover crop would be to chemically *desiccate* the cover crop using a contact herbicide. The current study evaluates the usefulness of using herbicide-desiccated cover crops in the vine row as a means to control weeds during vineyard establishment.
- There are actually two studies involved here. In the *first study*, the authors compare 3 ways of handling a cover crop before vineyard establishment: **mowing, incorporation by cultivation, and desiccation by herbicide treatment**. In the *second study*, the authors compare 4 types of cover crops: **wheat, rye, oats, and hairy vetch**. The questions the authors were trying to answer are: 1) *which cover crop management is more effective in suppressing weeds and enhancing young vine growth*; and 2) *which cover crop species gives the best results*?
- The study took place in Purdue University, Indiana, using the hybrid cultivars Seyval and Vignoles. The first study had a split-plot design: the 2 cultivars were the main plots and the 3 cover crop managements were the subplots – with 4 replications per treatment. The second study had a randomized complete block design with 5 replications per treatment. Two of the 4 cover crops species were seeded either in the fall or in the spring. Additionally there were 2 controls: a completely “weed-free plot” (manually weeded), and a “weed-full plot” (no weeding and completely undisturbed soil).
- **1) Which cover crop management regime was most effective?** The herbicide-desiccated rye provided better weed suppression than the mowed rye or the incorporated rye. The mowed rye offered only incomplete soil coverage, whereas the incorporated rye disturbed the soil, likely enhancing further weed germination. To the authors, these results show the potential of a desiccated cover crop left on the soil as a mulch to control weeds during the first year of vineyard establishment.
- **2) Which cover crop species was most effective?** 1) Spring-planted cereals resulted in the best weed suppression. This was due to the fact that the herbicide only suppressed the spring-planted cereal, whereas it completely killed the cereal planted in fall. Thus, the spring-planted cover crop likely continued to exert competitive and allelopathic effects (the detrimental effects of one plant species on another), which resulted in a more complete suppression of weeds. 2) Wheat, oats, and rye were similarly effective in suppressing weeds, whereas vetch showed only a moderate effect. 3) Vines in all the cover-cropped plots grew less (in terms of leaf area, leaves per vine, shoot length, and top and root dry mass) than in the weed-free control – although they grew twice as much in the cover crop plots as in the plot where weeds had been left to grow undisturbed.

In conclusion, the use of cover crops in the vine row, followed by its desiccation so it could act as a mulch, was effective in controlling weeds during vineyard establishment, something which is likely to later reduce labor costs and chemical input. *Spring-planted rye* was the cover crop that provided the best combination of weed suppression and vine growth. This summary is a bit old, and is certainly not an endorsement of the use of herbicides. It's simply here to inform you.

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