University of California
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Selecting Legume Cover Crops When Managing Verticillium Wilt

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EXTENSION SUMMARY

Verticillium wilt is caused by *Verticillium dahliae*, a widespread, soilborne fungal pathogen in California affecting hundreds of crops, including strawberry. When *V. dahliae* is present in a field, selecting cover crops that minimize pathogen increase can help manage *V. dahliae* populations. True grasses are generally not considered hosts of *V. dahliae* and would be a good choice for a cover crop. In the mustard family, broccoli and Brussels sprouts have been shown to reduce *V. dahliae* populations in the soil. In the legume family, recent research, described below, has evaluated several commonly grown leguminous plants for susceptibly. All seven varieties evaluated were found to support *V. dahliae*, serving as hosts to the pathogen, but to varying levels. Overall, the research shows low susceptibility of legume cover crops to colonization by *V. dahliae* when soil inoculum level is low and when grown during winter conditions on California's central coast. Though the threat to increasing soil inoculum may be low, caution should be exercised. A final table presents a ranking aimed to aid in selecting legumes that will not aggravate problems caused by *V. dahliae*.

INTRODUCTION

Cover cropping with leguminous species is an old practice often integrated into a rotation scheme for its contribution to soil nitrogen. The use of cover crops can also contribute to disease management provided they do not support the development of a pathogen, such as *Verticillium dahliae,* which causes Verticillium wilt. *Verticillium dahliae* is a widespread, soilborne fungal pathogen in California affecting hundreds of crops, including strawberry. In host plants, the fungus produces durable microsclerotia in infected plant tissue, which can survive in soil for many years and cause disease on susceptible crops grown in subsequent years. Rotation crops that appear to be nonhosts, because they show no symptoms of disease, may nevertheless support development of the pathogen and production of microsclerotia, and thus negate the benefit of crop rotation.

RESEARCH SUMMARY

This study was undertaken to evaluate the extent to which common legume cover crops are colonized by *V. dahliae* and support formation of microsclerotia. Seven legumes were evaluated for systemic colonization by *V. dahliae* and potential to support inoculum production. This included seven cool-season legumes: 'Windsor' broad bean, bell bean, field pea, hairy vetch, common vetch, purple vetch and 'Lana' woolypod vetch. Results showed that all seven legumes tested were susceptible to colonization by *Verticillium dahliae*, though all infected plants remained symptomless. Once infected, field pea residue contained the highest levels of inoculum; however, it was less frequently infected than other legumes. In summary, the results of this study demonstrate that legumes have the potential to become systemically colonized by *V. dahliae* with few or no disease symptoms. The ranking of legumes reported below should help growers to select cover crops that will not aggravate problems caused by *V. dahliae*.

Lloyd, M. and Gordon, T.R. 2015. Strawberry Production and Management of Soilborne Diseases in the Post-Fumigation Era. PhD Dissertation. University of California Press.

Legume Cover Crop Selection for Managing Verticillium Wilt

Legume	Selection when *V. dahliae* is present
Common vetch *(Vicia sativa subsp. sativa)*	**Poor choice** (Good host for *V. dahliae* colonization and reproduction)
Field pea *(Pisum arvense)* **Purple vetch** *(Vicia benghalensis)* **'Windsor' Broad bean** *(Vicia faba var. faba*, large seeded*)* **Lana' Woolypod vetch** *(Vicia dasycarpa)*	**Intermediate choice** (Intermediate host for *V. dahliae* colonization and reproduction)
Hairy vetch *(Vicia sativa subsp. sativa)* **Bell bean** *(Vicia faba,* small seeded*)*	**Best choice** (Not a good host for *V. dahliae* colonization and reproduction)

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