

Sustainable Disease Management of Legume Vegetable Crops in the Home Garden

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INTRODUCTION

Beans and peas, both legume crops, are excellent plants to integrate into gardens for multiple reasons. These plants are affected by few of the diseases that affect other popular garden plants. Beans and peas increase nitrogen fertility where they are planted, enriching the soil for the plants that are to follow them in a rotation. These plants can be extremely productive, and are a great source of dietary fiber and, in some cases, vegetable protein.

CULTURAL PRACTICES

Treated pea seed may be sown into light soils as early as March, but beans should be sown after risk of frost has passed and soils have warmed. Cool soils promote rots of seeds and seedlings. Beans and peas should be spaced appropriately to maintain air flow, decrease humidity, and reduce leaf wetness. Bush, pole, and half-runner beans should be trellised to decrease soil contact and maximize light. As with most plants, do not handle beans while the vines and foliage are visibly wet to reduce plant injury. Do not fertilize excessively with nitrogen. Beans may be succession planted for extended harvests, but should not be planted into ground that had peas or beans in the recent past. If seed is to be saved for future crops, save only disease-free pods and ensure seed is appropriately dried before storage.

RESISTANCE

Most French and green beans have been bred for resistance to anthracnose, but resistance in other types of beans is unavailable. 'Caprice,' 'Espada,' 'Kentucky Blue,' 'Romano II,' 'Volunteer,' and 'Goldkist' are fungal leaf spot and/or rust-resistant bean varieties, with additional resistance to various viral diseases. 'Green Arrow,' 'Cascadia,' 'Sugar Daddy,' and 'Oregon Sugar Pod II' are pea varieties suggested for their resistance to powdery mildew, Fusarium, and Verticillium wilts. For additional variety recommendations specific to Kentucky, please see UK ID-133.

USING THE TABLE

The following table focuses on cultural practices aimed at reducing risk of developing diseases of legumes. Cultural practices should be implemented in each plant growth stage, regardless of fungicide program, for optimal disease management. Many cultural practices target multiple diseases, as shown in the table. If disease pressure is high, growers may consider the fungicides listed in the right-hand column. Organic fungicides (OMRI-approved) are marked with an asterisk (*). All fungicides require excellent coverage of plant tissue and recurrent applications for maximum effectiveness. For best results, most fungicides should be reapplied when residues are no longer visible or on a 10-day interval, whichever occurs sooner.

RESOURCES

- Plant Pathology Extension Publications
<http://www2.ca.uky.edu/agcollege/plantpathology/extension/pubs.html>
- Home Vegetable Gardening (ID-128)
<http://www.ca.uky.edu/agc/pubs/id/id128/id128.pdf>
- IPM Scouting Guide for Common Problems of Legume Vegetables Crops in Kentucky (ID-227)
<http://www2.ca.uky.edu/agc/pubs/ID/ID227/ID227.pdf>
- Bean Diseases (PPFS-VG-16)
http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-VG-16.pdf
- Cornell University Tables of Resistant Vegetable Varieties
<http://vegetablemndonline.ppath.cornell.edu/Tables/TableList.htm>

Time of Year ¹	Growth Stage	Cultural Management	Target Disease	Chemical Management ²
March-April (peas) May (earliest beans)	Seeding	Plant resistant varieties; Plant pathogen-free seed; Practice crop rotation; Increase spacing between plants/rows.	Angular leaf spot	--
			Anthracnose	Plant treated seed
			Bacterial brown spot	--
			Bean rust	--
			Cercospora leaf spot	Plant treated seed
			Common bacterial blight	--
			Sclerotinia white mold	--
			Viruses	--
April (peas) June (beans)	Vegetative growth	Remove infected leaves/stems/plants; Remove weeds; Avoid overhead watering. Viruses - Manage insect vectors.	Angular leaf spot	Chlorothalonil ⁴ or Sulfur ^{3*}
			Anthracnose	Chlorothalonil ⁴ or Copper*
			Bacterial brown spot	Copper*
			Bean rust	Chlorothalonil ⁴ or Sulfur ^{3*}
			Cercospora leaf spot	Chlorothalonil ⁴ or Copper* or Sulfur ^{3*}
			Common bacterial blight	Copper*
			Sclerotinia white mold	Chlorothalonil ⁴
			Viruses	--
April-May (peas) June-July (beans)	Blossom	Remove infected leaves/stems/plants; Remove weeds; Avoid overhead watering. Viruses - Manage insect vectors.	Angular leaf spot	Chlorothalonil ⁴ or Sulfur ^{3*}
			Anthracnose	Chlorothalonil ⁴ or Copper*
			Bacterial brown spot	Copper*
			Bean rust	Chlorothalonil ⁴ or Sulfur ^{3*}
			Cercospora leaf spot	Chlorothalonil ⁴ or Copper* or Sulfur ^{3*}
			Common bacterial blight	Copper*
			Sclerotinia white mold	Chlorothalonil ⁴
			Viruses	--
May-June (peas) June-July (beans)	Pod bearing	Remove infected leaves/stems/pods/plants; Remove weeds; Avoid overhead watering. Viruses - Manage insect vectors.	Angular leaf spot	Chlorothalonil ⁴ or Sulfur ^{3*}
			Anthracnose	Chlorothalonil ⁴ or Copper*
			Bacterial brown spot	Copper*
			Bean rust	Chlorothalonil ⁴ or Sulfur ^{3*}
			Cercospora leaf spot	Chlorothalonil ⁴ or Copper* or Sulfur ^{3*}
			Common bacterial blight	Copper*
			Sclerotinia white mold	Chlorothalonil ⁴
			Viruses	--
July (peas) August- September (beans)	End of season	Gather all remaining plant tissue and destroy; Deep-till to encourage decomposition; Do not save seeds.		

¹ Growth stage typically occurs during this time of year. However, time of year may vary from year to year depending on environmental conditions.

² Products approved by the Organic Materials Review Institute (OMRI) for organic production are noted with an *

³ Phosphorous acid and/or sulfur dust may injure plants; test on a small area, wait at least 3 days, and inspect for damage prior to treating entire planting.

⁴ Avoid spraying chlorothalonil on blossoms, as it may pose a risk to honeybees.

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