

Ornamental plants for *Phytophthora*-infested landscapes

Michelle Henson, Suzette Sharpe, Inga Meadows. Mountain Research Station, North Carolina State University, Department of Entomology and Plant Pathology, Waynesville, North Carolina



Project Summary: Several popular bedding plants are susceptible to *Phytophthora* root and crown rot, a soilborne plant pathogen that can cause devastating economic losses to the ornamental plant industry. Controlling the disease can be particularly difficult once the pathogen is established, making the use of resistant or tolerant plants ideal for infested landscapes.

In summer 2019, we evaluated 14 annuals and 16 herbaceous perennials (Table 1) to multiple species of *Phytophthora*. Some of the plant species and/or cultivars chosen for this study were re-evaluated from our 2018 study

([https://content.ces.ncsu.edu/phytophthora-root-and-](https://content.ces.ncsu.edu/phytophthora-root-and-crown-rot-in-the-landscape)

[crown-rot-in-the-landscape](https://content.ces.ncsu.edu/phytophthora-root-and-crown-rot-in-the-landscape)). Three landscape beds were established in different regions of western North Carolina (Mills River, NC; Waynesville, NC; Salisbury, NC) and were infested with three species of *Phytophthora* known to cause disease of nursery crops. As disease symptoms progressed, symptomatic plants were harvested and processed to determine the presence of *Phytophthora* and/or other common diseases that may have been suspected.

Fig 1. Landscape bed at the Mountain Horticultural Crops Research Station (left) and various ornamental flowers at the Piedmont Research Station landscape bed (right)

Results: Fifteen cultivars of the evaluated annuals and twelve cultivars of the evaluated herbaceous perennials appeared excellent or good (Table 1) throughout the growing season (June 3 – September 20, 2019). *Phytophthora* was recovered from four cultivars of the evaluated annuals and four cultivars of the evaluated perennials and these plants were rated as Fair or Poor. Plants that were placed in the ‘Other’ category had other problems and will need to be reevaluated to confirm resistance. This study provides evidence of 27 ornamental plant cultivars that can be used as acceptable alternatives in landscape beds infested with *Phytophthora*.

Future Implications: This project has been funded for an additional two years (2020-2021) by the Horticultural Research Institute. We plan to evaluate additional cultivars of annuals and herbaceous perennials in the upcoming growing season(s) and selecting plants based on input from NC landscapers and nursery growers.



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Table 1. List of annual and herbaceous perennial cultivars that were evaluated for tolerance or resistance to *Phytophthora* spp. from June 3 to September 20, 2019.

Rating ^a	Type	Plant Species	Cultivar	Disease ID ^b
Excellent	Annuals	Angelonia (<i>Angelonia angustifolia</i>)	ArchAngel Blue	-
			Serenita White	-
		Sweet Potato Vine (<i>Ipomoea batatas</i>)	Ace of Spades	-
			Tri-Color	-
		West Indian Lantana (<i>Lantana camara</i>)	Miss Huff	-
		Lantana (<i>Lantana hybrida</i>)	Little Lucky Pot of Gold	-
			Little Lucky Peach Glow	-
		African Marigold (<i>Tagetes erecta</i>)	Antigua Yellow	-
		Zinnia (<i>Zinnia angustifolia</i>)	Star White	-
			Star Orange	-
	Perennials	Hybrid Yarrow (<i>Achillea filipendulina</i>)	Moonshine	-
		Ornamental Sedge (<i>Carex flacca</i>)	Blue Zinger	-
		Ornamental Sedge (<i>Carex testacea</i>)	Prairie Fire	-
		Tickseed (<i>Coreopsis auriculata</i>)	Nana	-
		Coneflower (<i>Echinacea purpurea</i>)	PowWow Wildberry	-
			Cheyenne Spirit	-
		Verbena (<i>Glandularia canadensis</i>)	Homestead Purple	-
		Ornamental Grass (<i>Miscanthus sinensis</i>)	Little Zebra	-
		Ornamental Grass (<i>Panicum virgatum</i>)	Shenandoah	-
			Rotstrahlbusch	-
Good	Annuals	Celosia (<i>Celosia cristata</i>)	Dracula	A, U
		African Marigold (<i>Tagetes erecta</i>)	Antigua Orange	F
		French Marigold (<i>Tagetes patula</i>)	Janie Deep Orange	A
			Janie Spry	A
		Verbena hybrid (<i>Verbena hybrida</i>)	Superbena Royal Chambray	A
	Perennials	Rose mock vervain (<i>Glandularia canadensis</i>)	Homestead Purple	A
		Peruvian mock vervain (<i>Glandularia peruviana</i>)	EnduraScape Red	A
Fair	Annuals	Verbena hybrid (<i>Verbena hybrida</i>)	Lanai Upright Rose with Eye	P
		Annual vinca (<i>Catharanthus roseus</i>)	Cora Cascade Lilac	L, P
			Cora Cascade Strawberry	L
Poor	Annuals	Petunia (<i>Petunia x hybrida</i>)	Night Sky	P
	Perennials	Verbena hybrid (<i>Verbena hybrida</i>)	Superbena Stormburst	P
		Alyssum (<i>Alyssum wulfenianum</i>)	Golden Spring	P
		Yarrow (<i>Achillea leisi</i>)	King Edward	P
Other	Annuals	Lychnis (<i>Lychnis arkwrightii</i>)	Orange Gnome	A, U, P
	Perennials	Tickseed (<i>Coreopsis verticillata</i>)	Starlight	U
			Sunfire	U
		Bee balm (<i>Monarda didyma</i>)	Pardon My Cerise	I, M
			Pardon My Purple	I, M
			Balmy	I, L, M, N
		Black-eyed Susan (<i>Rudbeckia hirta</i>)	Little Goldstar	A, S

^a**Disease Rating Scale:** **Excellent** = no disease symptoms, excellent floral quality, survived entire growing season. **Good** = minor disease symptoms, good floral quality, most survived entire growing season. **Fair** = moderate disease symptoms, less than half (<6) the plants died before end of growing season. **Poor** = severe disease symptoms, more than half (>6) the plants died before end of growing season. **Other** = more than half (>6) the plants had abiotic or unknown issues that prevented a fair trial of the cultivars resistance or tolerance to *Phytophthora*.

^b**Disease ID Letter Code:** **A:** Abiotic, **F:** *Fusarium*, **I:** Insect, **L:** Leaf spot, **M:** Powdery Mildew, **N:** Nematodes (parasitic), **P:** *Phytophthora*, **S:** Southern Blight, **U:** Unknown