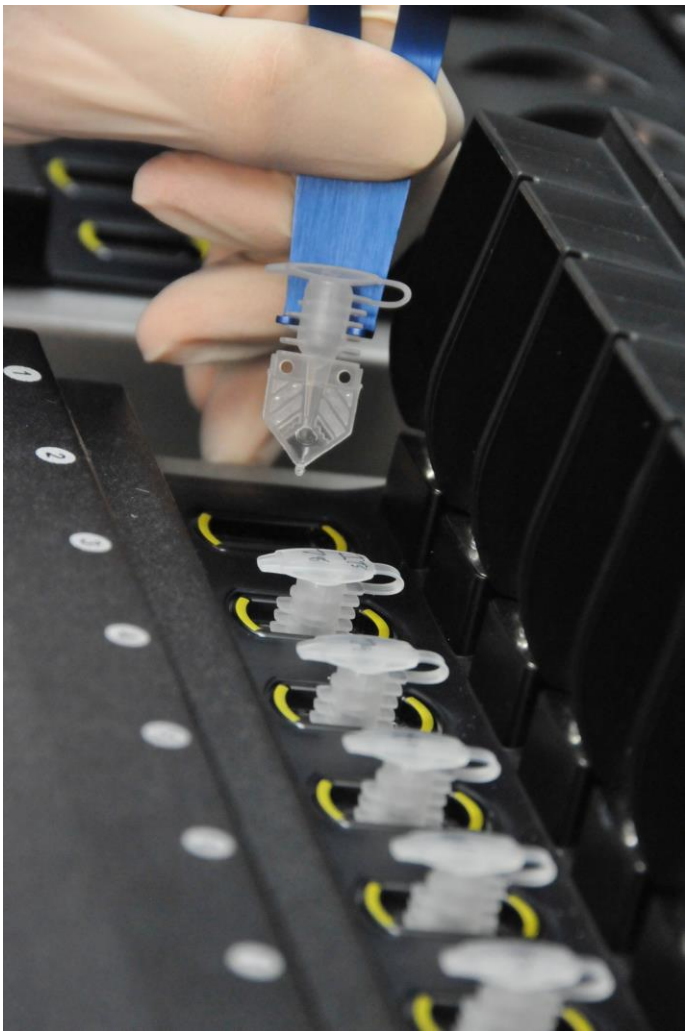


2017 Annual Report for the Molecular Plant Pathogen Detection Lab

The Molecular Plant Pathogen Detection Lab

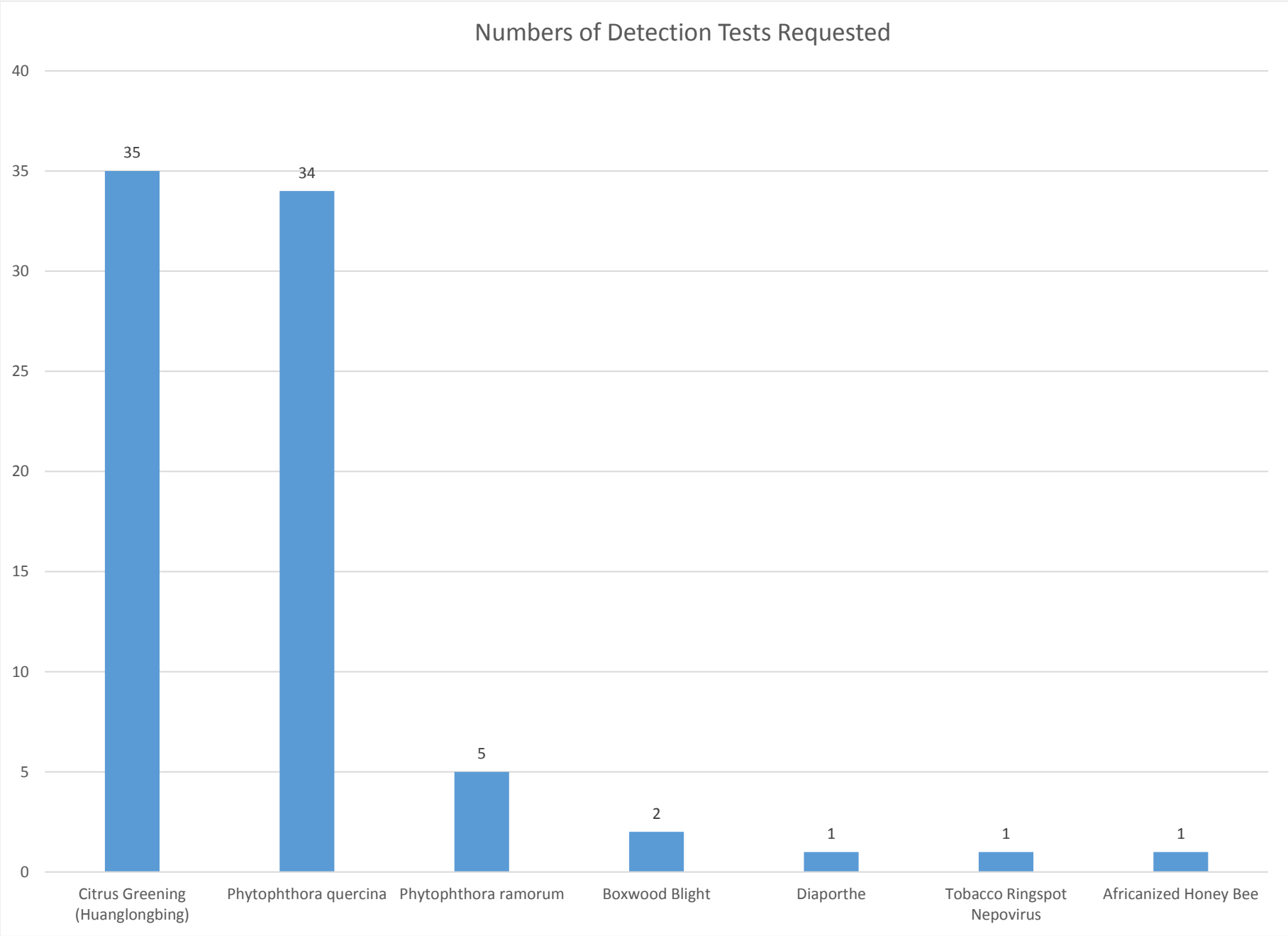
The Molecular Plant Pathogen Detection (MPPD) Lab utilizes two molecular techniques to identify plant pathogens, conventional polymerase chain reaction (PCR) and real-time PCR. Culturing and morphology and ELISA are also used, as needed.

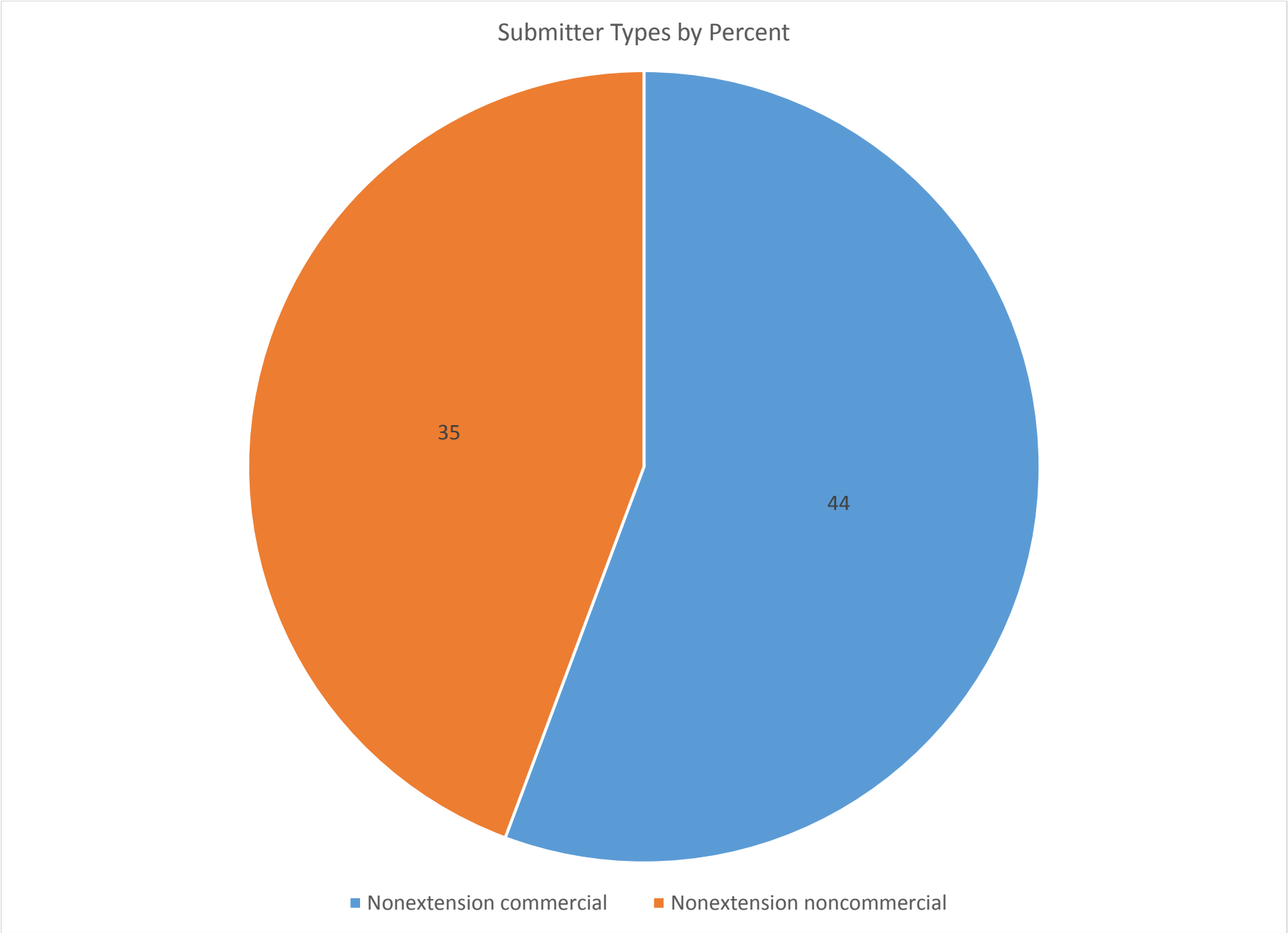
The PCR process allows us to amplify a trace amount of pathogen DNA into a larger and more easily detectable amount of DNA. This technique identifies pathogens much faster than traditional techniques, and identifies pathogens that are difficult to isolate and culture.

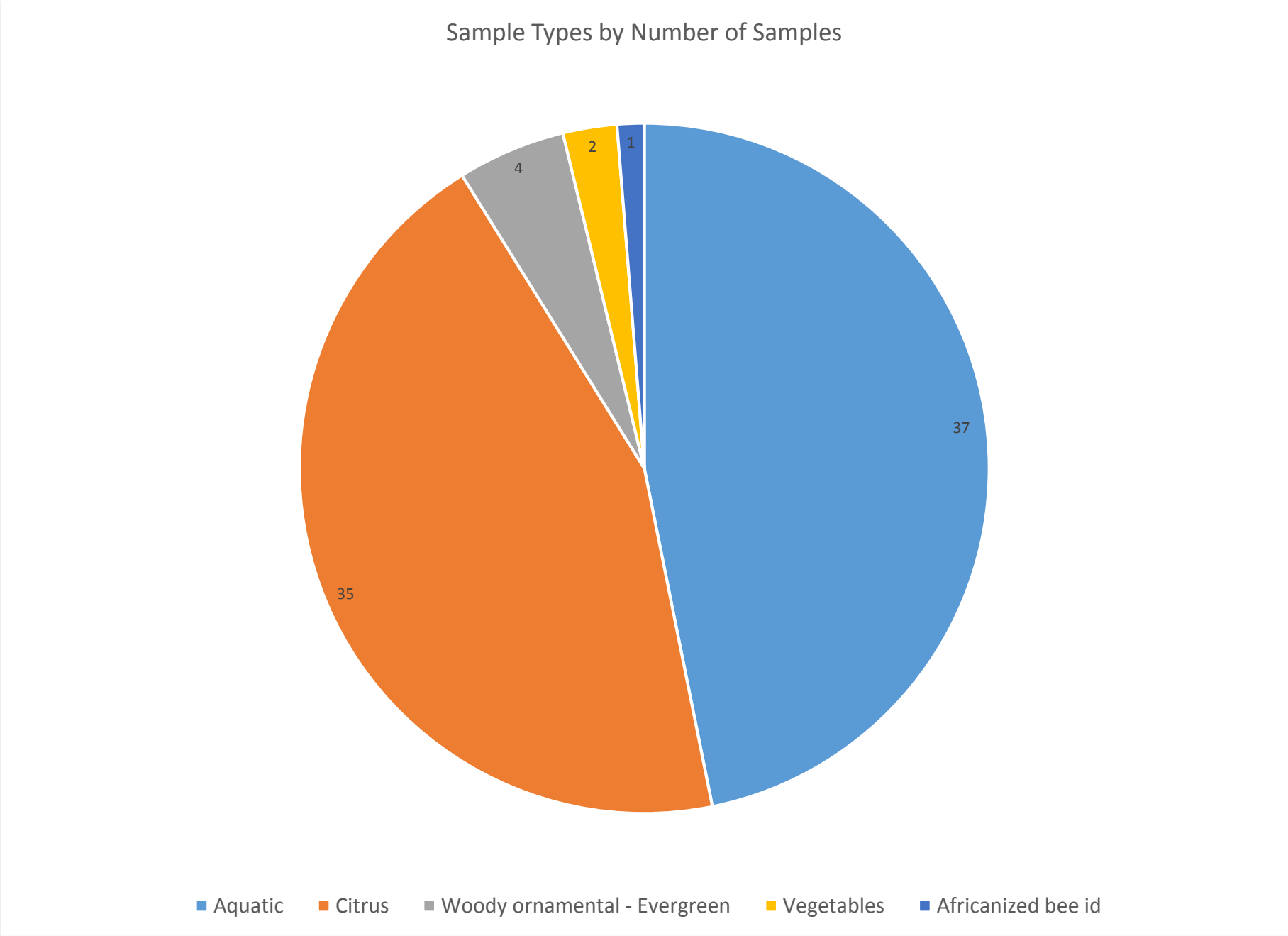
The main purpose of the lab is to support South Carolina growers in the early detection of plant diseases, especially those that are of USDA-APHIS regulatory concern. The Clemson MPPD lab is accredited under the USDA National Plant Protection Laboratory Accreditation Program (NPPLAP) in molecular diagnostics for HLB (Citrus Greening) and Sudden Oak Death, or Ramorum blight, caused by *Phytophthora ramorum.*

The Lab has taken on other projects as well, such as molecular identification of Africanized honeybees and surface water microbial tracking. The MPPD lab is assisting South Carolina municipalities in meeting EPA water quality standards by doing the water microbial tracking. A real-time PCR method was tested and successfully implemented to differentiate fecal coliforms of animal origin in water samples. In FY 2016, we expanded the water sampling program for counties and municipalities as a service. This project is being done in conjunction with the Clemson Center for Watershed Excellence. These results are not reported in this document.

Dr. Curt Colburn, MPPD Lab Director


Numbers of Detection Tests Requested
40
35
30
25
20
15
10
5
0
35
34
5
2
1
1
1
Citrus Greening (Huanglongbing)
Phytophthora quercina
Phytophthora ramorum
Boxwood Blight
Diaporthe
Tobacco Ringspot Nepovirus
Africanized Honey Bee


Submitter Types by Percent
35
44
Nonextension commercial
Nonextension noncommercial


Sample Types by Number of Samples
37
35
4
2
1
Aquatic
Citrus
Woody ornamental - Evergreen
Vegetables
Africanized bee id

Detections and Identifications through the Molecular Plant Pathogen Detection Lab in 2017

	Confirmed	Not detected	Suspected	Inconclusive
AFRICANIZED HONEY BEE TESTING				
Honey Bee and products (Apis mellifera)				
European honey bee (Apis mellifera european)	1	0	0	0
BOXWOOD BLIGHT				
Boxwood (Buxus sp./spp.)				
Boxwood blight; Leaf and stem blight (Calonectria pseudonaviculata)	0	1	0	0
Common Boxwood (Buxus sempervirens)				
Boxwood blight; Leaf and stem blight (Calonectria pseudonaviculata)	1	0	0	0
CITRUS SAMPLES				
Sweet Orange (Citrus sinensis)				
Citrus greening huanglongbing (Asian) (Candidatus Liberibacter asiaticus)	0	2	0	0
Tangelo (Citrus x tangelo)				
Citrus greening huanglongbing (Asian) (Candidatus Liberibacter asiaticus)	0	1	0	0
Satsuma; Mandarin; tangerine (Citrus reticulata)				
Citrus greening huanglongbing (Asian) (Candidatus Liberibacter asiaticus)	0	28	0	0
Key Lime (Citrus aurantifolia)				
Citrus greening huanglongbing (Asian) (Candidatus Liberibacter asiaticus)	0	3	0	0
Lemon (Citrus limon)				
Citrus greening huanglongbing (Asian) (Candidatus Liberibacter asiaticus)	0	1	0	0
PHYTOPHTHORA DISEASES ON PLANTS				
Common Camellia (Camellia japonica)				
Ramorum blight (Phytophthora ramorum)	0	2	0	0

2017 Molecular Plant Pathogen Detection Lab Survey

	Confirmed	Not detected	Suspected	Inconclusive
PHYTOPHTHORA DISEASES ON PLANTS				
Northern Red oak (Quercus rubra)				
Phytophthora crown and root rot (Phytophthora cinnamomi)	1	0	0	0
Phytophthora oak decline; Root rot (Phytophthora quercina)	0	1	0	0
White Oak (Quercus alba)				
Phytophthora crown and root rot (Phytophthora cinnamomi)	2	0	0	0
Phytophthora oak decline; Root rot (Phytophthora quercina)	0	2	0	0
PHYTOPHTHORA SPECIES IN WATER SOURCES				
Ponds; Lakes; impounded waters (Aquatic habitat)				
Phytophthora cinnamomi	4	0	0	0
Phytophthora quercina	0	15	0	0
River; Stream; creek; waterway (Aquatic habitat)				
Phytophthora quercina	0	16	0	0
Phytophthora cinnamomi	4	0	0	0
Phytophthora ramorum	0	3	0	0
SOYBEAN DISEASES				
Soybean (Glycine max)				
Soybean Phomopsis blight (Diaporthe phaseolorum sojae)	1	0	0	0
Tobacco ringspot (TRSV) (Nepovirus Tobacco Ringspot Virus)	0	1	0	0