# 2017 Annual Report of the Clemson University Commercial Turfgrass Clinic

**by Jacob Taylor**

# Introduction

The Clemson University Commercial Turf Clinic, formerly located at the Clemson Pee Dee Research and Education Center, has been in operation at the Pendleton, South Carolina location since 2013. The Clinic provides expedited diagnostic services to golf courses and other turf management professionals.

We have recently committed to partial funding for a Turfgrass Science student assistantship in the Commercial Turf Clinic. Mr. Jacob Taylor, one of Dr. Haibo Liu's students, will graduate with his MS in December but will probably go on for a PhD after that. We hope he'll continue to serve the Commercial Turf Clinic as he pursues this advanced degree. I'd like to thank Jacob for putting this excellent report together.

This year, the Clinic processed 122 samples and this is the highest number yet. These came from South Carolina and a number of other states, mostly in the southeastern U.S.

I am extremely appreciative of the valuable consulting assistance provided by Dr. Bruce Martin and Dr. Bert McCarty, two well known and respected specialists in the Turfgrass Management field. Dr. Martin has also been generous enough to provide complete diagnostics during times when I must be out of the Lab. Turf Entomologist, Dr. J.C. Chong also provided management recommendations. Nematologist, Dr. Paula Agudelo and her staff promptly ran nematode assay samples when nematodes were suspected to be the main problem. The valuable assistance of all these specialists has helped to make the Commercial Turfgrass Clinic a success and their continued support is much appreciated.

Hopefully, the information in this report will be helpful to our clientele, Turfgrass Consultants, Extension Agents, Regulatory Inspectors, students and other plant professionals.

Meg Williamson, Clemson University Plant Disease Diagnostician

## Personnel Perfoming Diagnoses/ Identifications

Each sample may involve one or more diagnosticians. Hence this section may not represent the total number of samples proccessed during this time period.

Curt Colburn, processed 3 sample(s).
Predeesh Chandran, processed 2 sample(s).
Brad Addy, processed 20 sample(s).
Timothy Drake, processed 1 sample(s).
Meg Williamson, processed 116 sample(s).

## Personnel Providing Management Advice

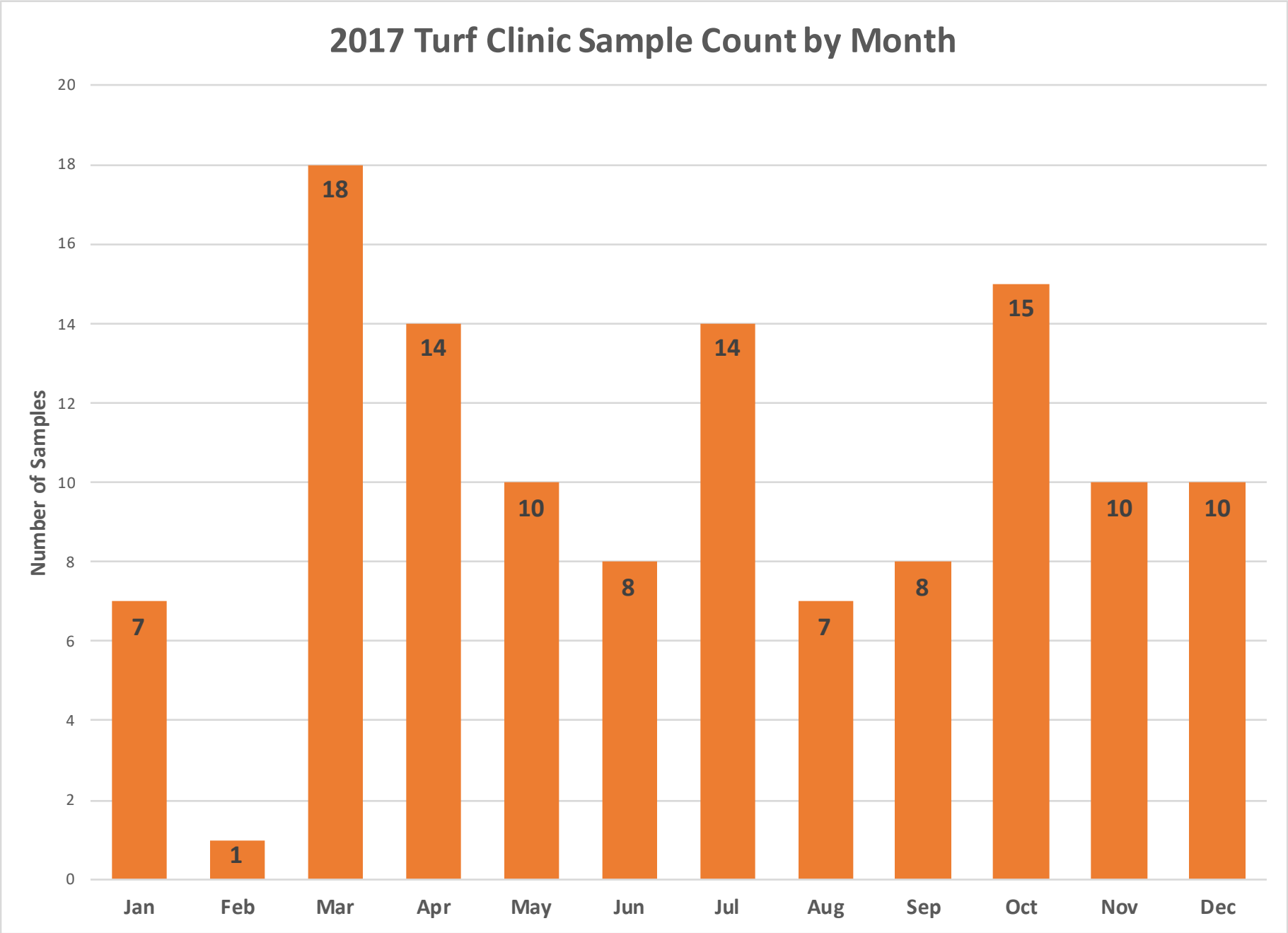
Each sample may involve one or more advisory consultants. Hence this section may not represent the total number of samples processed during this time period.

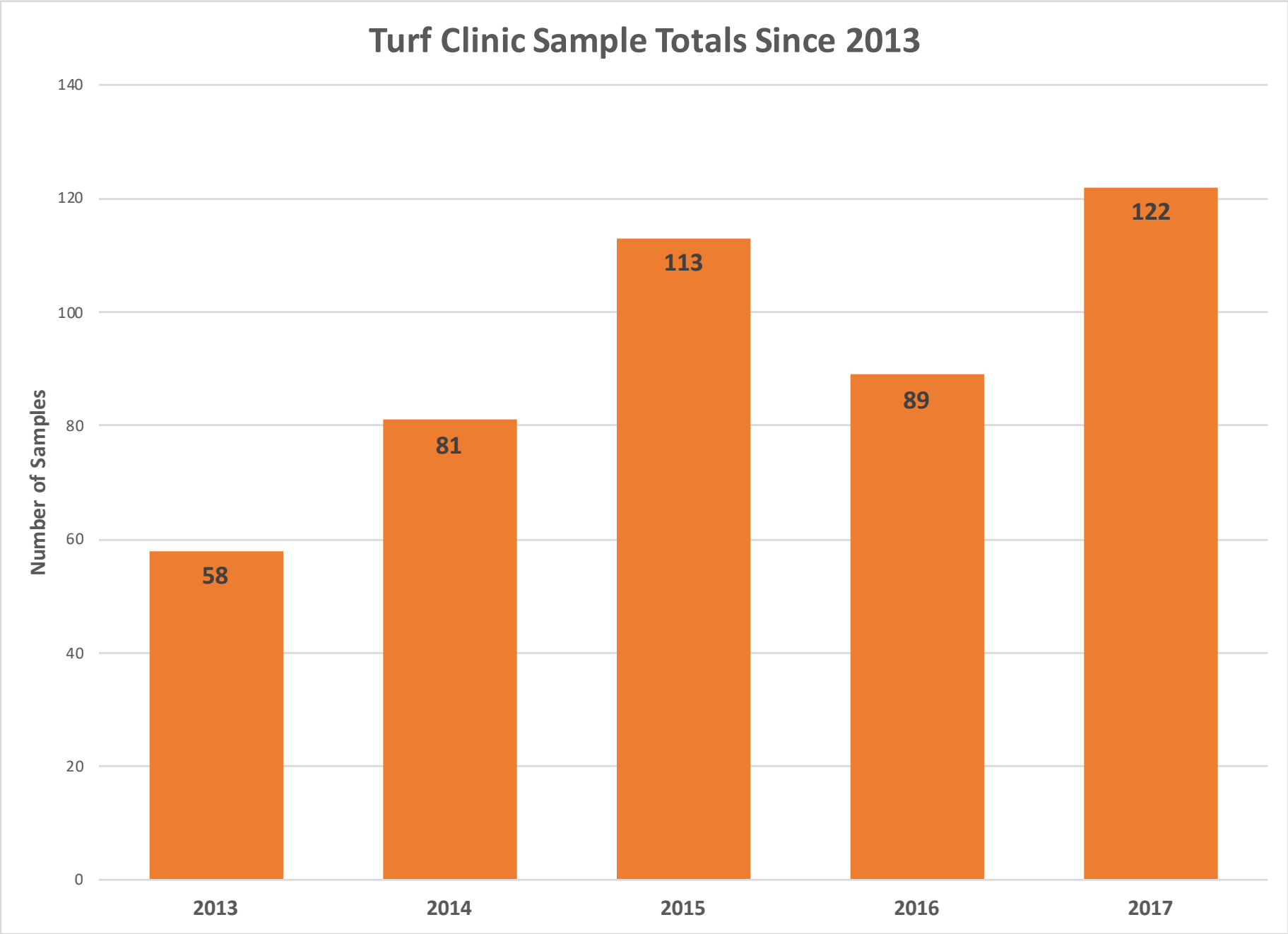
Bert McCarty, gave advice for 2 sample(s).
Bruce Martin, gave advice for 1 sample(s).
J. C. Chong, gave advice for 3 sample(s).

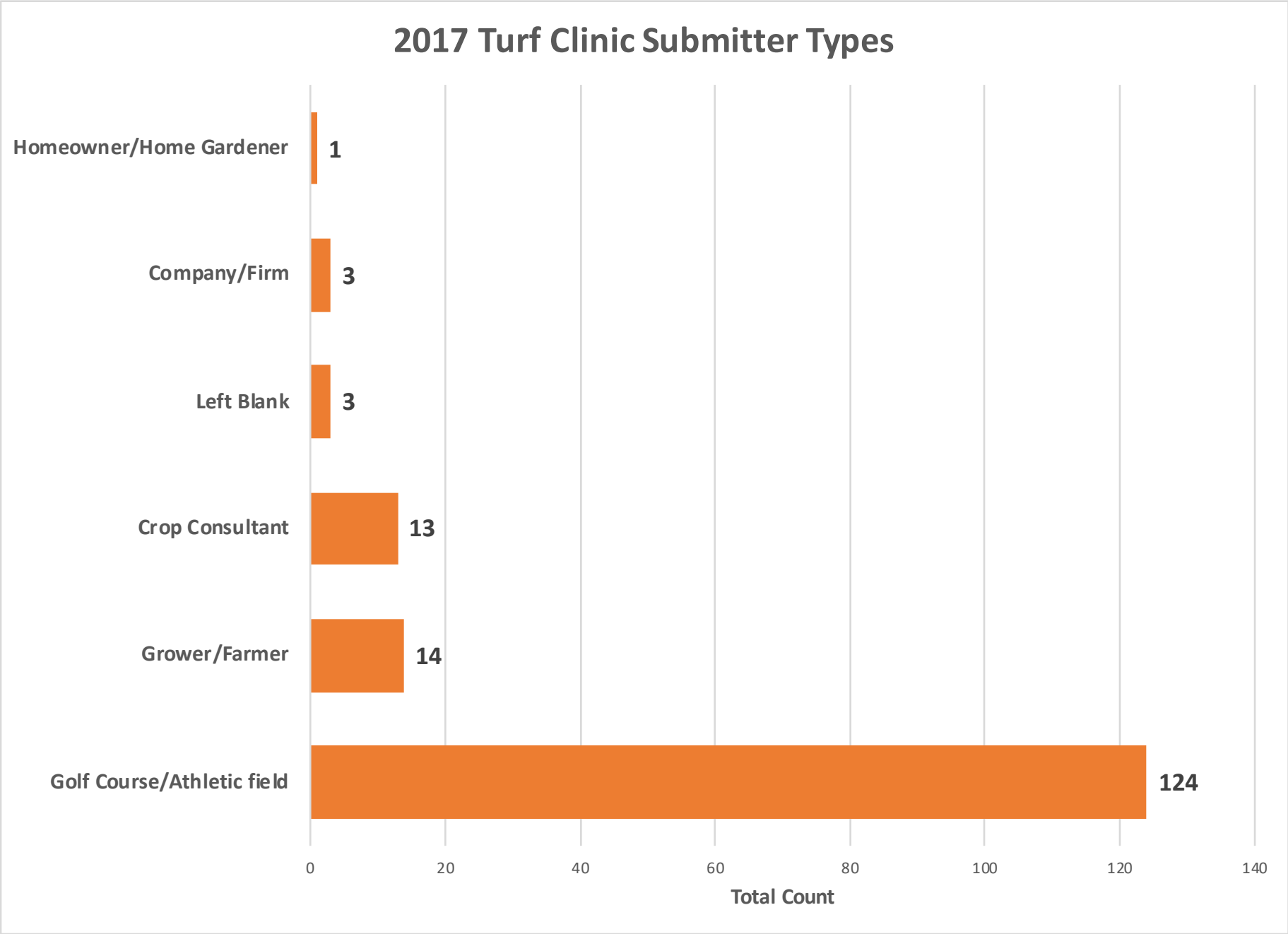
## Personnel Providing Client Responses

Each sample may involve one or more client responses. Hence this section may not represent the total number of samples processed during this time period.

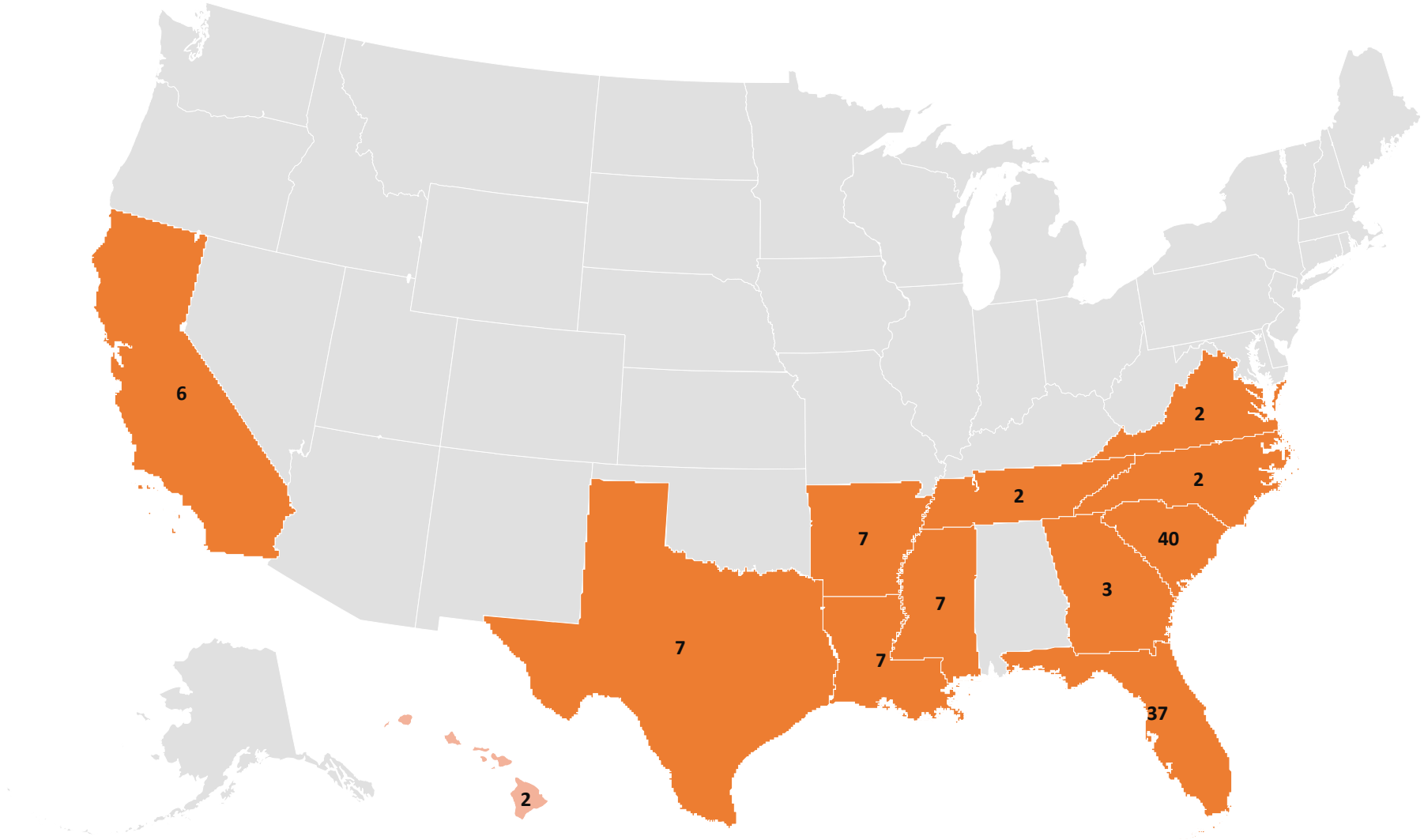
Curt Colburn, gave advice for 1 sample(s).
Meg Williamson, gave advice for 116 sample(s).
Brad Addy, gave advice for 8 sample(s).

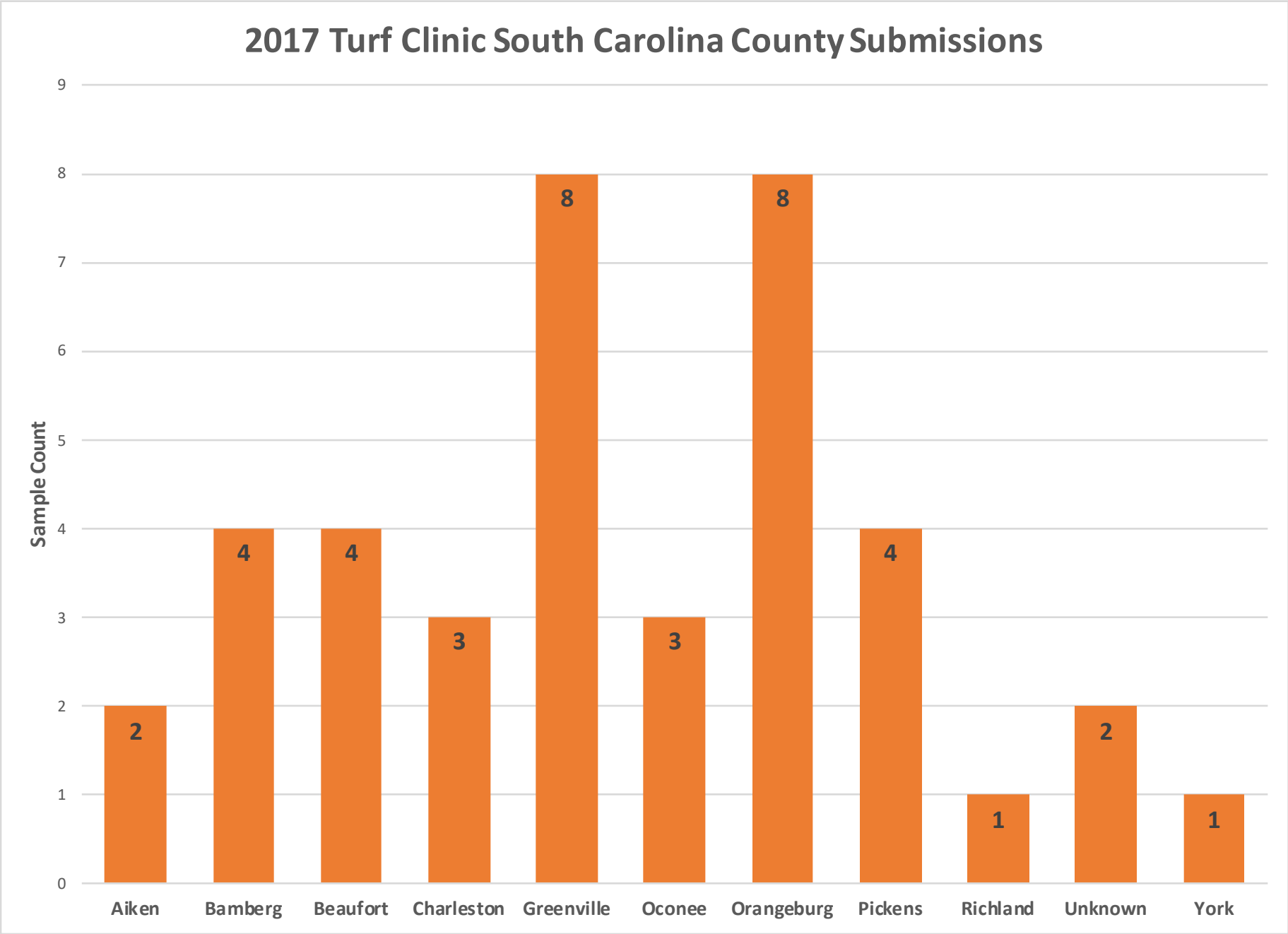

2017 Turf Clinic Sample Count by Month
Number of Samples
0
2
4
6
8
10
12
14
16
18
20
7
1
18
14
10
8
14
7
8
15
10
10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

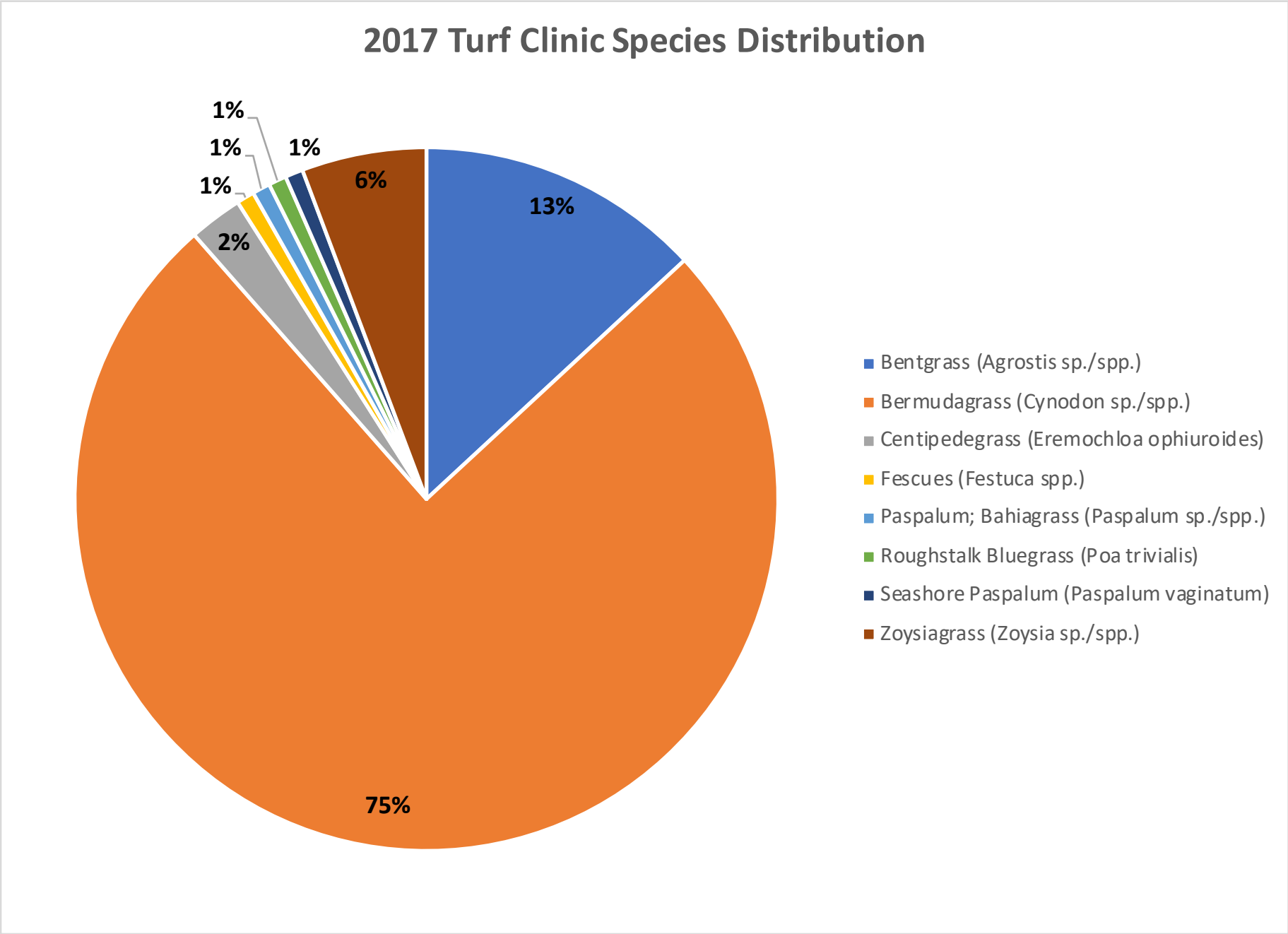

Turf Clinic Sample Totals Since 2013
Number of Samples
140
120
100
80
60
40
20
0
58
81
113
89
122
2013
2014
2015
2016
2017

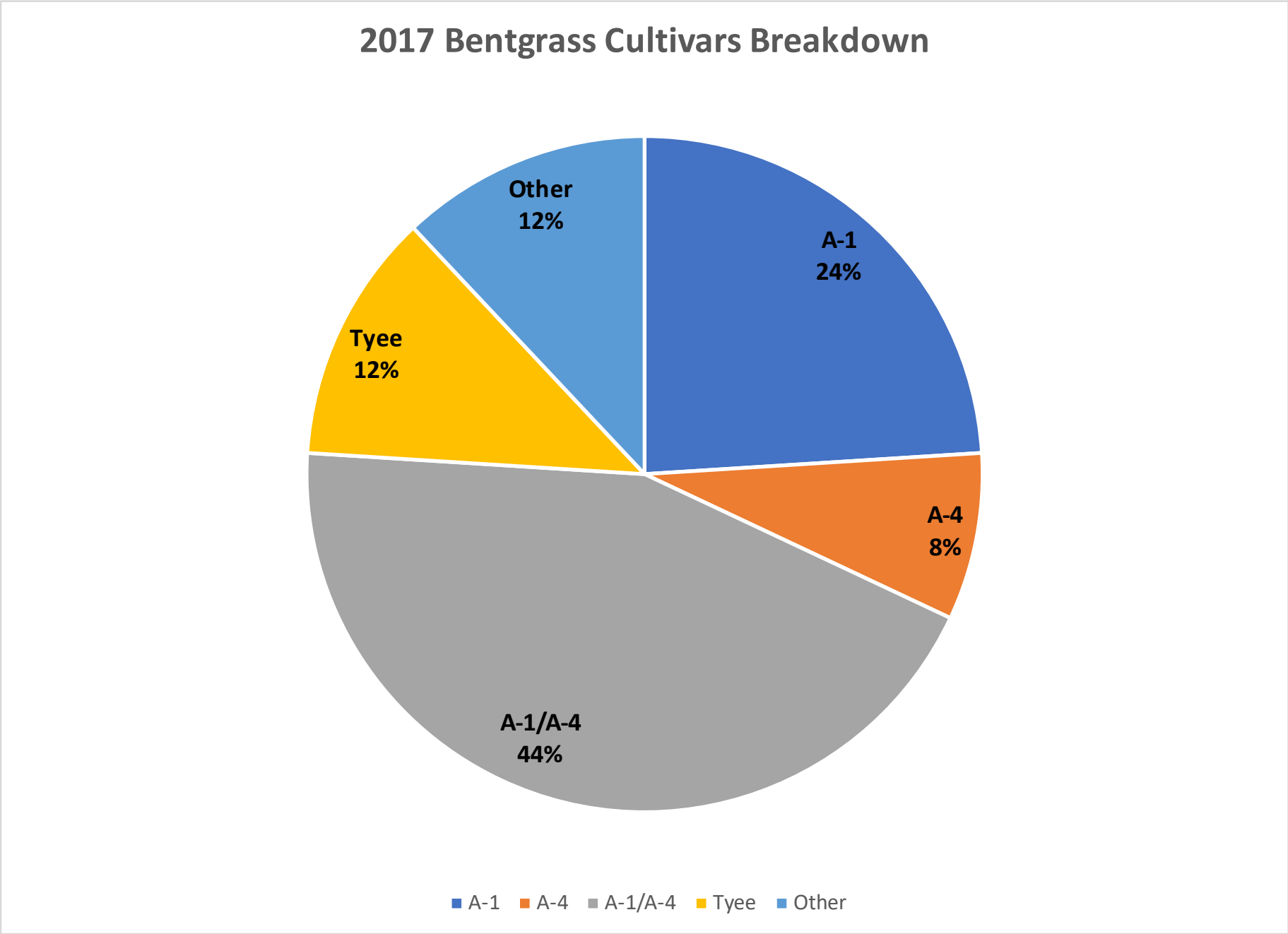

2017 Turf Clinic Submitter Types
Homeowner/Home Gardener
1
Company/Firm
3
Left Blank
3
Crop Consultant
13
Grower/Farmer
14
Golf Course/Athletic field
124
0
20
40
60
80
100
120
140
Total Count

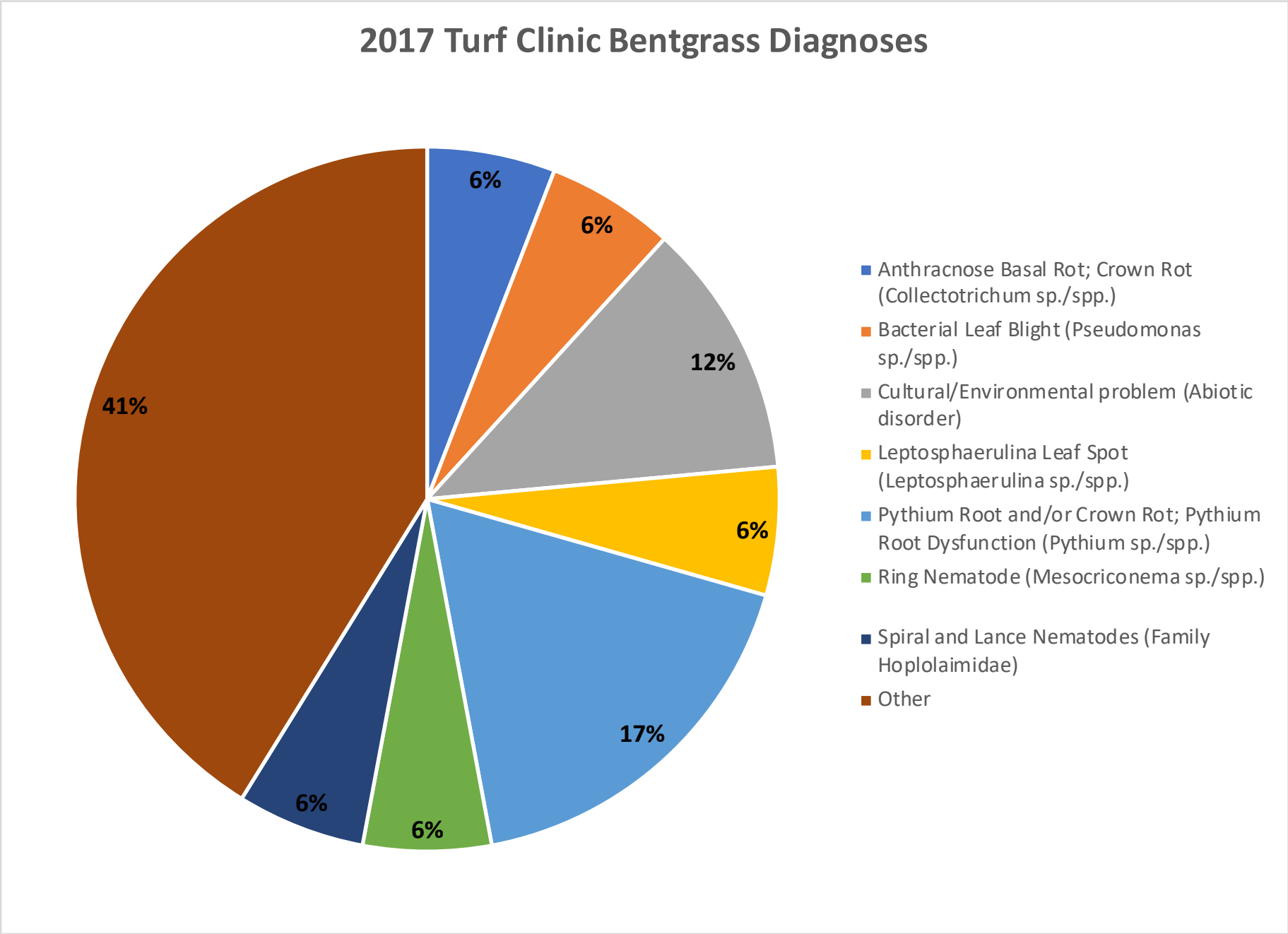
# States that Submitted Samples in 2017

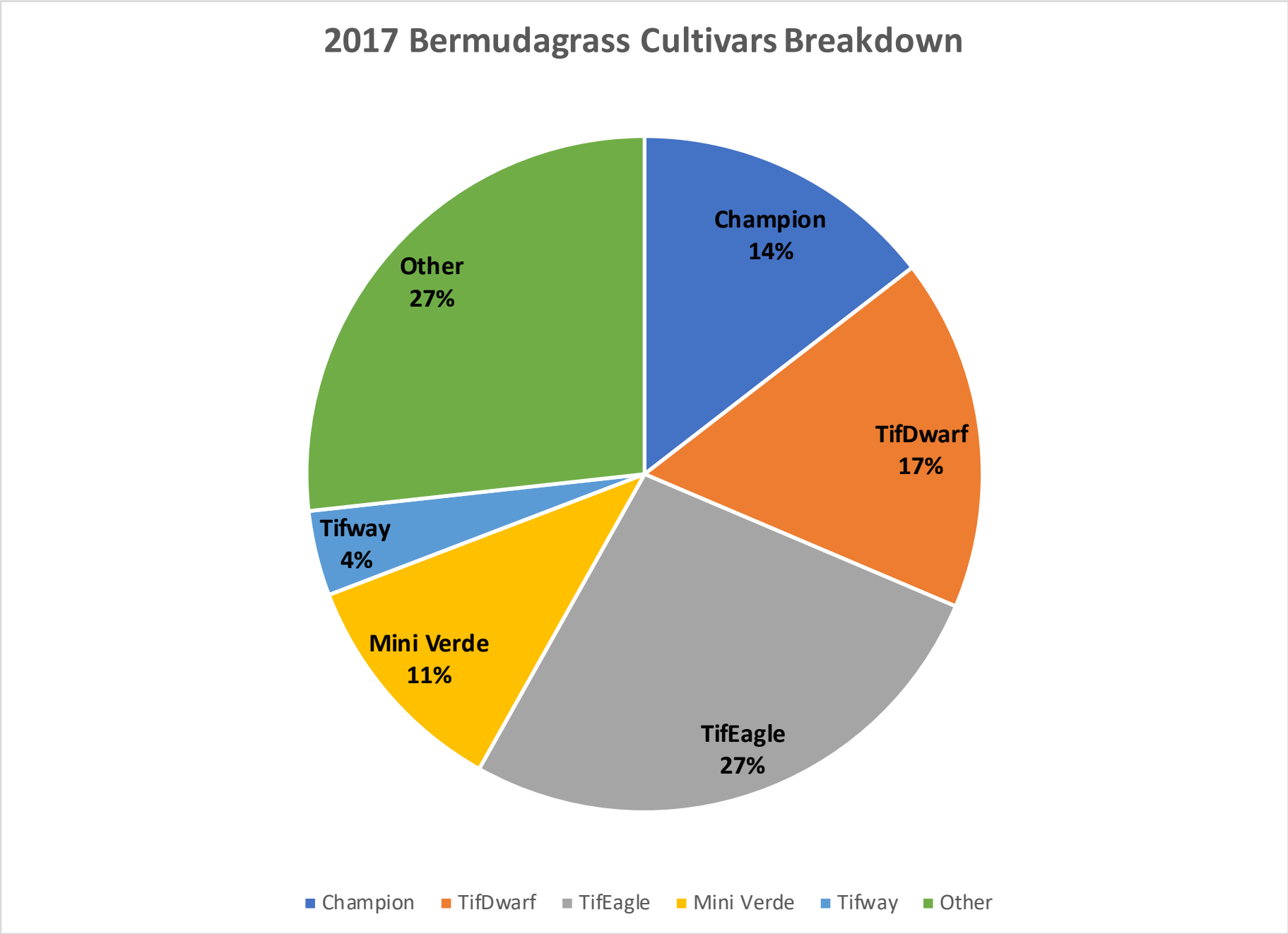


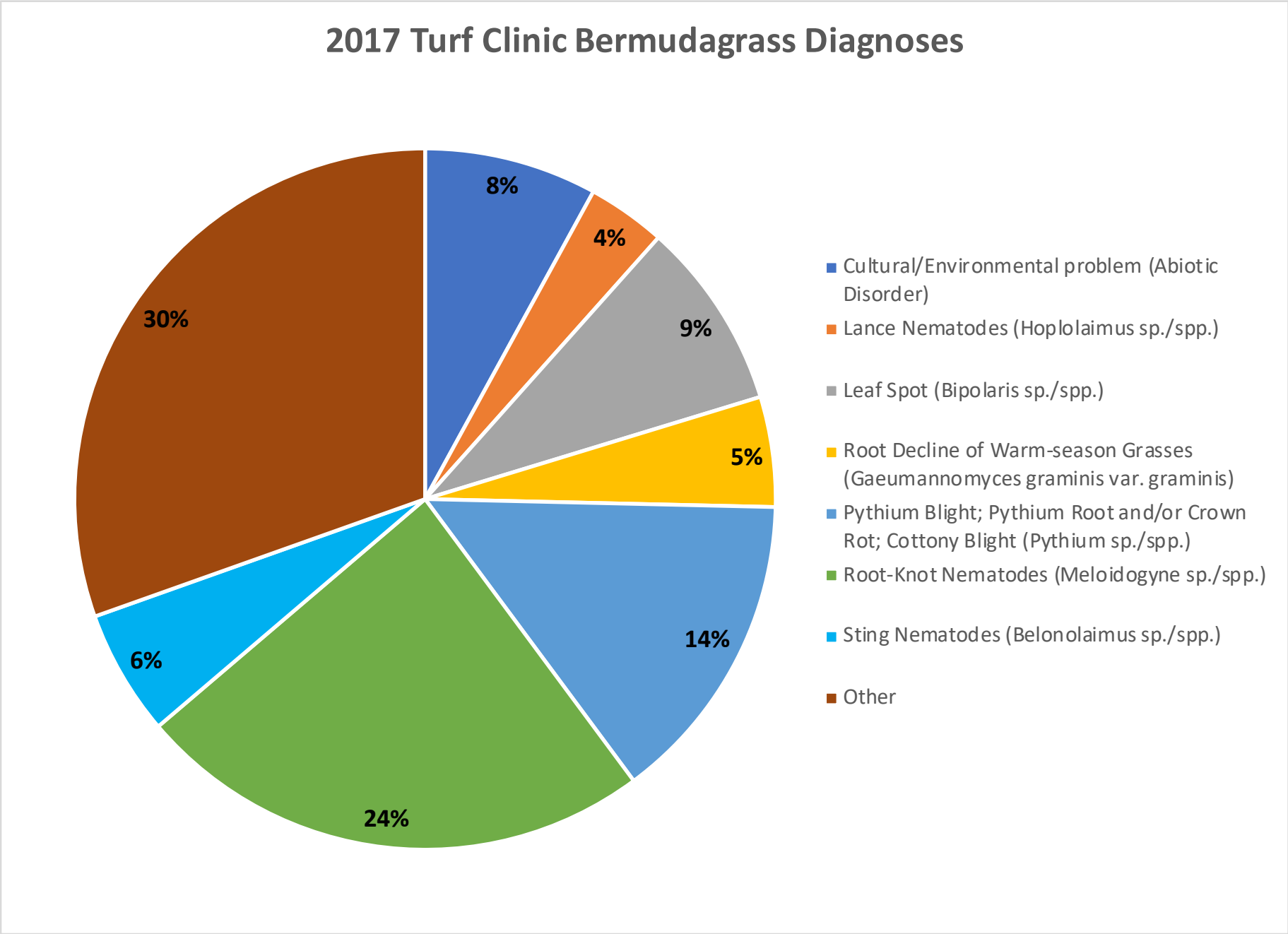

2017 Turf Clinic South Carolina County Submissions
Sample Count
0
1
2
3
4
5
6
7
8
9
2
4
4
3
8
3
8
4
1
2
1
Aiken
Bamberg
Beaufort
Charleston
Greenville
Oconee
Orangeburg
Pickens
Richland
Unknown
York

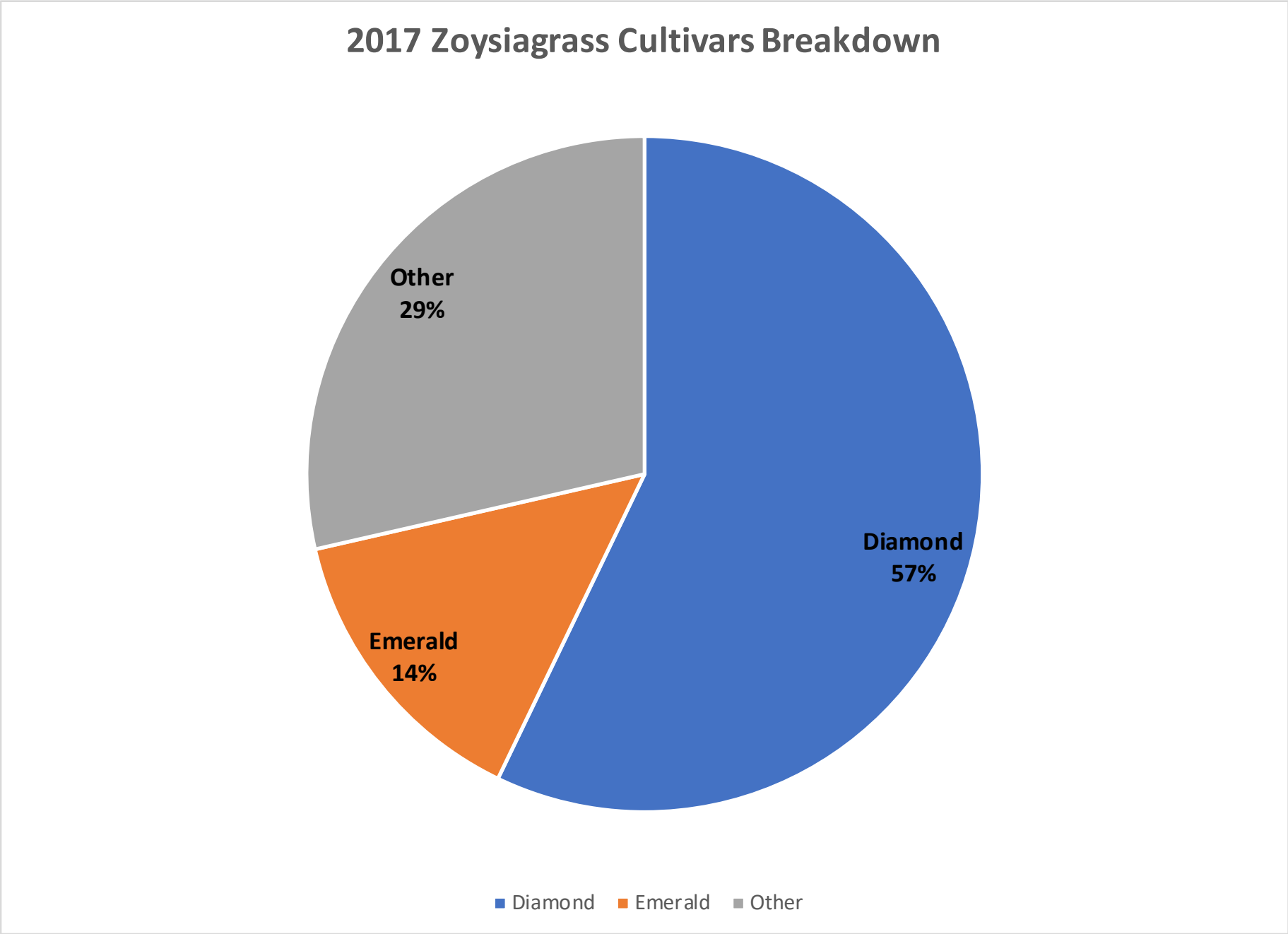

2017 Turf Clinic Species Distribution
1%
1%
1%
1%
6%
13%
2%
75%
Bentgrass (Agrostis sp./spp.)
Bermudagrass (Cynodon sp./spp.)
Centipedegrass (Eremochloa ophiuroides)
Fescues (Festuca spp.)
Paspalum; Bahiagrass (Paspalum sp./spp.)
Roughstalk Bluegrass (Poa trivialis)
Seashore Paspalum (Paspalum vaginatum)
Zoysiagrass (Zoysia sp./spp.)


2017 Bentgrass Cultivars Breakdown
Other
12%
A-1
24%
Tyee
12%
A-4
8%
A-1/A-4
44%
A-1
A-4
A-1/A-4
Tyee
Other


2017 Turf Clinic Bentgrass Diagnoses
6%
6%
12%
6%
17%
6%
6%
41%
Anthracnose Basal Rot; Crown Rot (Collectotrichum sp./spp.)
Bacterial Leaf Blight (Pseudomonas sp./spp.)
Cultural/Environmental problem (Abiotic disorder)
Leptosphaerulina Leaf Spot (Leptosphaerulina sp./spp.)
Pythium Root and/or Crown Rot; Pythium Root Dysfunction (Pythium sp./spp.)
Ring Nematode (Mesocriconema sp./spp.)
Spiral and Lance Nematodes (Family Hoplolaimidae)
Other


2017 Bermudagrass Cultivars Breakdown
Champion
14%
TifDwarf
17%
TifEagle
27%
Mini Verde
11%
Tifway
4%
Other
27%
Champion
TifDwarf
TifEagle
Mini Verde
Tifway
Other


2017 Turf Clinic Bermudagrass Diagnoses
8%
4%
9%
5%
14%
24%
6%
30%
Cultural/Environmental problem (Abiotic Disorder)
Lance Nematodes (Hoplolaimus sp./spp.)
Leaf Spot (Bipolaris sp./spp.)
Root Decline of Warm-season Grasses (Gaeumannomyces graminis var. graminis)
Pythium Blight; Pythium Root and/or Crown Rot; Cottony Blight (Pythium sp./spp.)
Root-Knot Nematodes (Meloidogyne sp./spp.)
Sting Nematodes (Belonolaimus sp./spp.)
Other


2017 Zoysiagrass Cultivars Breakdown
Other
29%
Diamond
57%
Emerald
14%
Diamond
Emerald
Other

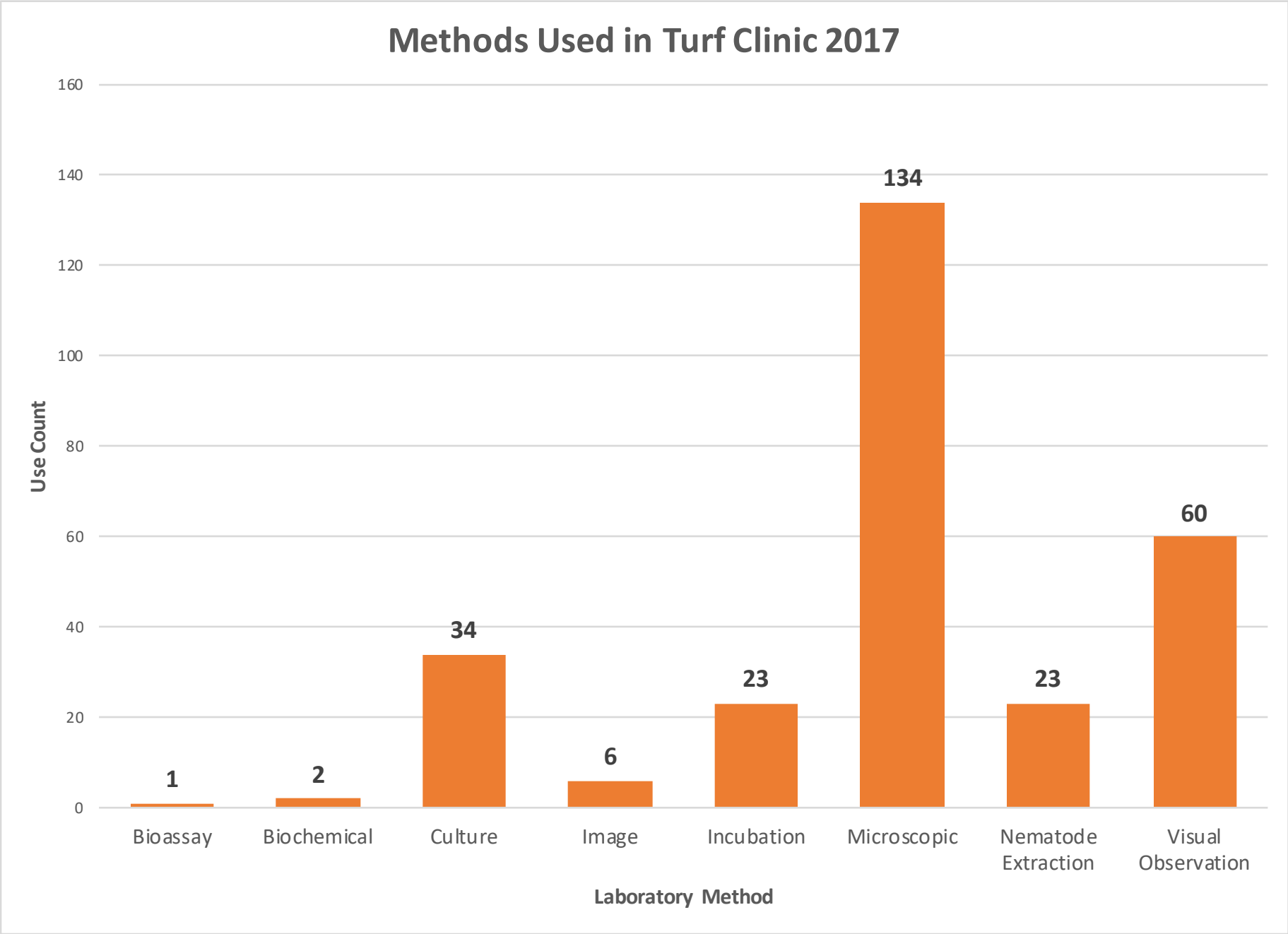
## Diagnoses and Identifications by Turfgrass Type

| | Confirmed | Not Detected | Suspected | Undetermined |
|---|---|---|---|---|
| **Bentgrass (Agrostis sp./spp.)** *(Host,Diagnosis/ID) (16,25)* | | | | |
| Algae (General) | 5 | 0 | 0 | 0 |
| Anthracnose basal rot; Crown rot (Colletotrichum sp./spp.) | 1 | 0 | 0 | 0 |
| Bacterial leaf blight (Pseudomonas sp./spp.) | 1 | 0 | 0 | 0 |
| Copper spot (Gloeocercospora sorghi) | 0 | 0 | 1 | 0 |
| Cultural/environmental problem (Abiotic disorder) | 2 | 0 | 3 | 0 |
| Dense thatch layer (Abiotic disorder) | 1 | 0 | 0 | 0 |
| Fairy ring (Various Fungi) | 0 | 0 | 0 | 1 |
| Leptosphaerulina leaf spot (Leptosphaerulina sp./spp.) | 1 | 0 | 0 | 0 |
| Pythium root and/or crown rot (Pythium sp./spp.) | 1 | 0 | 0 | 0 |
| Pythium root dysfunction (Pythium sp./spp.) | 2 | 0 | 0 | 0 |
| Ring nematode (Mesocriconema sp./spp.) | 1 | 0 | 0 | 0 |
| Spiral and lance nematodes (Family Hoplolaimidae) | 1 | 0 | 0 | 0 |
| Spiral nematodes (Helicotylenchus sp./spp.) | 1 | 0 | 0 | 0 |
| Take-all (Gaeumannomyces sp./spp.) | 0 | 0 | 1 | 0 |
| **Bermudagrass (Cynodon dactylon)** *(Host,Diagnosis/ID) (1,2)* | | | | |
| Leaf spot (Bipolaris sp./spp.) | 1 | 0 | 0 | 0 |
| Spring dead spot (Ophiosphaerella sp./spp.) | 0 | 0 | 1 | 0 |
| **Bermudagrass (Cynodon sp./spp.)** *(Host,Diagnosis/ID) (91,172)* | | | | |
| Microdochium patch (Microdochium nivale) | 1 | 0 | 0 | 0 |
| Algae (General) | 1 | 0 | 0 | 0 |
| Bacterial leaf spot (Xanthomonas campestris) | 1 | 0 | 0 | 0 |
| Bermudagrass mite (Eriophyes cynodoniensis) | 2 | 1 | 0 | 0 |
| Bipolaris spot blotch (Bipolaris sp./spp.) | 1 | 0 | 0 | 0 |
| Black layer of turfgrass (Abiotic disorder) | 1 | 0 | 0 | 0 |
| Chinch bug complex (Blissus sp./spp.) | 2 | 0 | 0 | 0 |
| Cream leaf blight (Limonomyces roseipellis) | 1 | 0 | 0 | 0 |

| | Confirmed | Not Detected | Suspected | Undetermined |
|---|---|---|---|---|
| Cultural/environmental problem (Abiotic disorder) | 3 | 0 | 13 | 0 |
| Curvularia blight; Leaf spot (Curvularia sp./spp.) | 4 | 0 | 0 | 0 |
| Dense thatch layer (Abiotic disorder) | 4 | 0 | 0 | 0 |
| **Bermudagrass (Cynodon sp./spp.)** *(Host,Diagnosis/ID) (91,172)* | | | | |
| Drainage problem (Abiotic disorder) | 1 | 0 | 2 | 0 |
| ETRI ectotrophic root infecting fungi (Complex of Fungi) | 8 | 0 | 0 | 3 |
| Fairy ring (Various Fungi) | 1 | 0 | 0 | 0 |
| Hydrophobic soil/planting mix/media (Abiotic disorder) | 2 | 0 | 1 | 0 |
| Lance nematodes (Hoplolaimus sp./spp.) | 5 | 0 | 1 | 0 |
| Leaf blotch (Bipolaris cynodontis) | 3 | 0 | 0 | 0 |
| Leaf spot (Bipolaris sp./spp.) | 10 | 0 | 0 | 0 |
| Leaf spot (Unidentified Fungus) | 0 | 0 | 0 | 1 |
| Leaf spot; Leaf blight (Exserohilum rostratum) | 2 | 0 | 0 | 0 |
| Leptosphaerulina leaf spot (Leptosphaerulina sp./spp.) | 1 | 0 | 0 | 0 |
| Mefenoxam resistant Pythium (Pythium sp./spp.) | 1 | 0 | 0 | 0 |
| Microdochium Leaf Spot (Microdochium sp.) | 2 | 0 | 0 | 0 |
| Microdochium blight; Monographella patch (Monographella nivalis) | 3 | 0 | 0 | 0 |
| Pythium blight; Cottony blight (Pythium sp./spp.) | 9 | 0 | 1 | 0 |
| Pythium root and/or crown rot (Pythium sp./spp.) | 2 | 2 | 0 | 0 |
| Pythium root dysfunction (Pythium sp./spp.) | 8 | 0 | 0 | 0 |
| Red leaf and sheath spot (Rhizoctonia zeae) | 1 | 0 | 0 | 0 |
| Rhodesgrass mealybug (Antonina graminis) | 4 | 0 | 0 | 0 |
| Root decline of warm season grasses (Gaeumannomyces graminis var. graminis) | 7 | 0 | 0 | 0 |
| Root problem (Unknown Cause) | 0 | 0 | 2 | 1 |
| Root problems (Abiotic disorder) | 0 | 0 | 0 | 1 |
| Root-knot nematodes (Family Heteroderidae) | 0 | 0 | 1 | 0 |
| Root-knot nematodes (Meloidogyne sp./spp.) | 33 | 0 | 1 | 0 |

| | Confirmed | Not Detected | Suspected | Undetermined |
|---|---|---|---|---|
| Seasonal leaf drop (Abiotic disorder) | 0 | 0 | 2 | 0 |
| Sheath blight (Rhizoctonia sp./spp.) | 2 | 0 | 0 | 0 |
| Sheath nematodes (Hemicycliophora sp./spp.) | 1 | 0 | 0 | 0 |
| Spiral nematodes (Helicotylenchus sp./spp.) | 1 | 0 | 0 | 0 |
| Sting nematodes (Belonolaimus sp./spp.) | 8 | 0 | 0 | 0 |
| Turf root-knot nematode (Meloidogyne graminis) | 1 | 0 | 0 | 0 |
| **Centipedegrass (Eremochloa ophiuroides)** *(Host,Diagnosis/ID) (3,3)* | | | | |
| Cultural/environmental problem (Abiotic disorder) | 0 | 0 | 1 | 0 |
| Curvularia blight; Leaf spot (Curvularia sp./spp.) | 1 | 0 | 0 | 0 |
| Dollar spot (Sclerotinia homeocarpa) | 1 | 0 | 0 | 0 |
| **Fescues (Festuca spp)** *(Host,Diagnosis/ID) (1,1)* | | | | |
| Pythium damping off (Pythium sp./spp.) | 1 | 0 | 0 | 0 |
| **Paspalum; Bahiagrass (Paspalum sp./spp.)** *(Host,Diagnosis/ID) (1,2)* | | | | |
| Cultural/environmental problem (Abiotic disorder) | 0 | 0 | 1 | 0 |
| Lance nematodes (Hoplolaimus sp./spp.) | 1 | 0 | 0 | 0 |
| **Roughstalk Bluegrass (Poa trivialis)** *(Host,Diagnosis/ID) (1,2)* | | | | |
| Dollar spot (Sclerotinia homeocarpa) | 1 | 0 | 0 | 0 |
| Sting nematodes (Belonolaimus sp./spp.) | 1 | 0 | 0 | 0 |
| **Seashore Paspalum (Paspalum vaginatum)** *(Host,Diagnosis/ID) (1,2)* | | | | |
| Dollar spot (Sclerotinia homeocarpa) | 1 | 0 | 0 | 0 |
| Fairy ring (Various Fungi) | 1 | 0 | 0 | 0 |
| **Zoysia Grass (Zoysia sp./spp.)** *(Host,Diagnosis/ID) (7,14)* | | | | |
| Anthracnose (Colletotrichum cereale) | 1 | 0 | 0 | 0 |
| Crambus sod webworm (Crambus sp./spp.) | 1 | 0 | 0 | 0 |
| Criconemoides ring nematodes (Criconemoides sp./spp.) | 2 | 0 | 0 | 0 |
| Cultural/environmental problem (Abiotic disorder) | 4 | 0 | 0 | 0 |
| ETRI ectotrophic root infecting fungi (Complex of Fungi) | 0 | 0 | 0 | 2 |
| Nematodes; General plant (Order Tylenchida) | 0 | 0 | 1 | 0 |

| | Confirmed | Not Detected | Suspected | Undetermined |
|---|---|---|---|---|
| Root problem (Unknown Cause) | 0 | 0 | 0 | 1 |
| Root-knot nematodes (Meloidogyne sp./spp.) | 1 | 0 | 0 | 0 |
| Unspecified pathology (Rhizoctonia sp./spp.) | 1 | 0 | 0 | 0 |


Methods Used in Turf Clinic 2017
Use Count
160
140
120
100
80
60
40
20
0
1
2
34
6
23
134
23
60
Bioassay
Biochemical
Culture
Image
Incubation
Microscopic
Nematode Extraction
Visual Observation
Laboratory Method