This annual publication is for the benefit of WPGA Member Clubs for their use in making decisions on golf course maintenance and related issues. It is only available in digital format.

Each WPGA Member Club was asked to complete the questionnaire which generated the data. Clubs have been organized into four groups based on annual operating budgets. 39 clubs participated in the survey this year and are listed below. Facilities with more than or less than 18 holes were adjusted as follows to reflect an 18-hole facility budget: (27 holes [-20%] / 36 holes [-40%] / 9 holes [+40%).

Group 1 consists of 7 clubs with budgets of $430,000 and below. Group 2 consists of 10 clubs with budgets between $500,000 & $840,435. Group 3 consists of 9 clubs with budgets between $898,437 and $1,200,000. And Group 4 consists of 12 clubs with budgets greater than $1,290,858.

Regional golf course superintendents’ chapters – Greater Pittsburgh, Mountain & Valley, Northwest Pennsylvania – assisted significantly in questionnaire return.

Trends of note include:

• The average percentage allocation of Budget for salaries, wages, and payroll taxes is consistent across all groups at 55%, with a low 53% for Group 1 and a high of 57% for Group 2
• Maintenance budgets in Group 1, 3, 4 have seen a steady increase, while maintenance budgets in Group 2 has seen a decrease (-4.4% over the last five years).
• Of the clubs surveyed, 3 irrigation systems, have been upgraded within the past 10 years with the most recent in 2017 and the oldest 78 years ago.
• More clubs (3) have reported having an equipment washing station that recycles or filters waste water versus 2017/2018
• Rounds decreased 5% in 2018
• Only 18 of the 38 clubs that submitted responses said they reported their water usage to the PA DEP under Act 220
• Only 6 clubs in groups 3 & 4 triplex, while only 3 clubs in Groups 1 & 2 walk mow greens
• All 9 limited ranges are from groups 1 & 2
Overall Numbers — Budgets
Results by all respondents are in light colors, results by club group are in dark colors.

Coding for categories:
- □ — Group 1 — $430,000 & Below Annual Operations Budgets - 7 Clubs
- ▲ — Group 2 — $500,000 – $840,435 Annual Operations Budgets - 10 Clubs
- ● — Group 3 — $898,437 – $1,200,000 Annual Operations Budgets - 9 Clubs
- ★ — Group 4 — $1,290,858 & Above Annual Operations Budgets - 12 Clubs

Committee & Architect
Golf course architect on retainer? ........................................................... 22 ……… 56.4% ……… 17 ……… 43.6%
Long-range plan prepared by an architect? ............................................. 18 ……… 46.2% ……… 21 ……… 53.8%
Do you close greens and use temporary greens in the winter? ................17 ……… 43.6% ……… 22 ……… 56.4%
If yes, do you use green covers? ............................................................. 17 ……… 43.6% ……… 22 ……… 56.4%
Lightning detection system on property? ................................................25 ……… 64.1% ……… 12 ……… 30.9%

Legend:
Low  Average  High

Maintenance Budgets 2019
Percent of Budget Increase/Decrease Since 2014
Increase/decrease in budget since 2012:  Low—(36%)  High—31%  Average—1.1%
Groups 3 & 4 combined based on 3 categories in 2014
Capital & Labor Budgets

Coding for categories:
- □ — Group 1 — $430,000 & Below Annual Operations Budgets - 7 Clubs
- ▲ — Group 2 — $500,000 – $840,435 Annual Operations Budgets - 10 Clubs
- ● — Group 3 — $898,437 – $1,200,000 Annual Operations Budgets - 9 Clubs
- ★ — Group 4 — $1,290,858 & Above Annual Operations Budgets - 12 Clubs

Labor Budgets

Capital Budgets

Percentage Maintenance Budget to Total Club Operating Budget

Percentage Capital Budget to Total Club Capital Budget

Replacement Value of Equipment

Bunker work at Wildwood Golf Club
Budget Miscellaneous & Human Resources

Percent of Capital Budget Expenditures
(all respondents)

| Equipment | 43.2% |
| Course Improvement | 20.7% |
| Maintenance Building | 4.7% |

2019

% Of Budget for Plant Protectants — 10.8%
% Of Budget for Fertilizers — 6%
% Of Budget for Staff Benefits — 5.8%
% Of Budget for Irrigation Water — 1.7%
% Of Budget for Maintenance Building Utilities — 2.7%
% Of Budget for Pump House Electric — 1.2%

Human Resources

Health Insurance
The average number of maintenance personnel on the employer’s health plan per Club.

- Group 1 — 1.2
- Group 2 — 3.1
- Group 3 — 7
- Group 4 — 12.5

Eight clubs pay 100% of health benefits for the superintendent, and the same eight cover the superintendent’s family as well.

Average percentage of benefit coverage paid by employer:

- Superintendent — 64.5%
- Superintendent Family — 47.5%
- Maintenance Staff — 51%
- Maintenance Staff Family — 48.5%

Retirement & Vacation Time

Eight clubs (21%) reported not offering retirement plan matching for the Superintendent.

Average percentage of retirement match paid by employer:

- 2019 Superintendent — 2.6%
- 2014 Superintendent — 2.5%

Average Days Vacation Days:

- Salary Employee — 17.4 Days
- Hourly Employee — 15.4 Days

Average Personal/Sick Days:

- Salary Employee — 4.9 Days
- Hourly Employee — 4 Days

#2 new greens complex during construction at Sewickley Heights.

Shaping of the “floor” on #18 at Sewickley Heights.
Overall Numbers — Staff Size

Coding for categories:
- ■ — Group 1 — $430,000 & Below Annual Operations Budgets - 7 Clubs
- ▲ — Group 2 — $500,000 – $840,435 Annual Operations Budgets - 10 Clubs
- ● — Group 3 — $898,437 – $1,200,000 Annual Operations Budgets - 9 Clubs
- ★ — Group 4 — $1,290,858 & Above Annual Operations Budgets - 12 Clubs

<table>
<thead>
<tr>
<th>Category</th>
<th>All Clubs</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-Time Employees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>8</td>
<td>6.8</td>
<td>10.5</td>
<td>6</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>15</td>
<td>10.2</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>20</td>
<td>10.2</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>25</td>
<td>25</td>
<td>25</td>
<td>10.2</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Seasonal Employees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>5.7</td>
<td>7.1</td>
<td>7.1</td>
<td>7.1</td>
<td>7.1</td>
</tr>
<tr>
<td>10</td>
<td>10.5</td>
<td>10.5</td>
<td>10.5</td>
<td>10.5</td>
<td>10.5</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>

Average Total Employees in Season
- Group 1 .................... 12.2  Comparison to 2013 ...... 11.3
- Group 2 .................... 15.4  Comparison to 2013 ...... 17.6
- Group 3 .................... 20.7  Comparison to 2013 ...... 26.3
- Group 4 .................... 25.4  Comparison to 2013 ...... ?

Average Total Maintenance Staff on Salary
- Group 1 .................... 1.2
- Group 2 .................... 4.0
- Group 3 .................... 2.4
- Group 4 .................... 3.6

Number of Assistant Superintendents on Hourly Wage
- Group 1 .................... 0.3
- Group 2 .................... 0.2
- Group 3 .................... 0.8
- Group 4 .................... 0.2

Average Key Employees

<table>
<thead>
<tr>
<th>Category</th>
<th>■</th>
<th>▲</th>
<th>●</th>
<th>★</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistant Superintendent</td>
<td>0.5</td>
<td>1.2</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>Mechanic</td>
<td>0.5</td>
<td>1.0</td>
<td>2.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Horticulturalist</td>
<td>0.2</td>
<td>0.4</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Irrigation Technician</td>
<td>0.3</td>
<td>0.6</td>
<td>0.6</td>
<td>0.9</td>
</tr>
<tr>
<td>Licensed Pesticide Applicators</td>
<td>1</td>
<td>2.3</td>
<td>2.9</td>
<td>4.7</td>
</tr>
<tr>
<td>Turfgrass Interns</td>
<td>0.2</td>
<td>0.1</td>
<td>0.3</td>
<td>0.9</td>
</tr>
</tbody>
</table>

Bunker renovation at Indiana Country Club
Mowing Acreage — All Courses

Legend: Low | Average | High

2019 (all respondents)

Greens

Approaches

Times Mowed — Per Week

2019 (all respondents)

Greens

Approaches

Fairways

(15 of 59 clubs mow fairways less than three times weekly)

Roughs

Clubs using walk mowers on greens – 22

Clubs that Tri-Plex greens – 14

Only 6 clubs in group 3 & 4, while only 3 groups in groups 1 & 2 walkmow greens
**Hours Mowing — Per Week**

**Coding for categories:**
- ■ — Group 1 — $430,000 & Below Annual Operations Budgets - 7 Clubs
- ▲ — Group 2 — $500,000 – $840,435 Annual Operations Budgets - 10 Clubs
- ● — Group 3 — $898,437 – $1,200,000 Annual Operations Budgets - 9 Clubs
- ★ — Group 4 — $1,290,858 & Above Annual Operations Budgets - 12 Clubs

### Average Total Hours Mowing Weekly

- **2012 Comparison**
  - Group 1 & 2 — 109 Hours
  - Group 3 — 248 Hours
  - Group 4 — 292 Hours

- **2019**
  - Group 1 — 92.7 Hours
  - Group 2 — 280.4 Hours
  - Group 3 — 261.5 Hours
  - Group 4 — 292.9 Hours

### Average Weekly Hours Mowing by Playing Area

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greens</td>
<td>26.0</td>
<td>37.6</td>
<td>85.5</td>
<td>110.1</td>
</tr>
<tr>
<td>Approaches</td>
<td>5.5</td>
<td>17.0</td>
<td>26.2</td>
<td>25.6</td>
</tr>
<tr>
<td>Tees</td>
<td>8.3</td>
<td>15.7</td>
<td>22.2</td>
<td>31.2</td>
</tr>
<tr>
<td>Fairways</td>
<td>26.5</td>
<td>33.4</td>
<td>45.6</td>
<td>51.3</td>
</tr>
<tr>
<td>Roughs</td>
<td>45.2</td>
<td>88.5</td>
<td>104.8</td>
<td>97.0</td>
</tr>
</tbody>
</table>

### Average Height of Cut — Inches

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greens</td>
<td>.133</td>
<td>.108</td>
<td>.102</td>
<td>.98</td>
</tr>
<tr>
<td>Approaches</td>
<td>.438</td>
<td>.366</td>
<td>.311</td>
<td>.313</td>
</tr>
<tr>
<td>Tees</td>
<td>.417</td>
<td>.393</td>
<td>.326</td>
<td>.355</td>
</tr>
<tr>
<td>Fairways</td>
<td>.579</td>
<td>.473</td>
<td>.434</td>
<td>.385</td>
</tr>
<tr>
<td>Roughs</td>
<td>.258</td>
<td>.228</td>
<td>.233</td>
<td>.248</td>
</tr>
</tbody>
</table>

### Average Times Per Week Greens Rolled

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greens</td>
<td>1.3</td>
<td>3.5</td>
<td>3.9</td>
<td>5.5</td>
</tr>
</tbody>
</table>

**Legend:**
- Low
- Average
- High

**2017 Height of Cut Greens (all clubs)**

**2008 Height of Cut Greens (all clubs)**

**Times Per Week Greens Rolled (all clubs)**

*Drainage work at the Longue Vue Club*
### Irrigation System

#### Capacity of Primary Pump Station (in Gallons per minute)

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>125</td>
</tr>
<tr>
<td>Average</td>
<td>1,199</td>
</tr>
<tr>
<td>High</td>
<td>4,500</td>
</tr>
</tbody>
</table>

#### Employees Used to Hand Water

<table>
<thead>
<tr>
<th>Count</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>3.4</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

Clubs that report water usage to the PA DEP under Act 220:
- Yes 18 (60%)
- No 21 (40%)

Clubs that have created and submitted a “Drought Emergency Operations Plan” to the PA Department of Environmental Protection:
- Yes 19 (49%)
- No 17 (51%)

Clubs that have vegetative buffer strips along water features:
- Yes 25 (76%)
- No 11 (24%)

Clubs that keep accurate records of fertilizer & pesticide applications:
- Yes 34 (98%)
- No 4 (2%)

Clubs that are aware neighboring states require a written Nutrient Management plan:
- Yes 36 (84.3%)
- No 3 (17.7%)

Clubs that have documented all best management practices as part of course management:
- Yes 18 (40%)
- No 21 (60%)

#### Irrigation System Years Installed

<table>
<thead>
<tr>
<th>Years Installed</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oldest</td>
<td>78</td>
</tr>
<tr>
<td>Newest</td>
<td>2</td>
</tr>
</tbody>
</table>

Of the clubs surveyed, 9 irrigation systems have been upgraded within the past 10 years. 16 Clubs reported having no cost for water.

#### Irrigation System Averages

**Group 1**
- Average Age of System: 31.5 Years
- Average Number Heads: 262.4
- Approximate Gallons Used 2018: 1.9 Million
- 2018 Average Water Cost: $5,091
- Approximate 5 Year Average Gallons Used: 8.1 Million
- Average Number of Irrigated Acreage: 29.5 Acres

**Group 2**
- Average Age of System: 38.5 Years
- Average Number Heads: 548
- Approximate Gallons Used 2018: 4.9 Million
- 2018 Average Water Cost: $8.786
- Approximate 5 Year Average Gallons Used: 7.5 Million
- Average Number of Irrigated Acreage: 59.4 Acres

**Group 3**
- Average Age of System: 27.4 Years
- Average Number Heads: 1139
- Approximate Gallons Used 2018: 6.7 Million
- 2017 Average Water Cost: $9.262
- Approximate 5 Year Average Gallons Used: 12 Million
- Average Number of Irrigated Acreage: 98.5 Acres

**Group 4**
- Average Age of System: 20.4 Years
- Average Number Heads: 1321
- Approximate Gallons Used 2018: 9.2 Million
- 2017 Average Water Cost: $32.213
- Approximate 5 Year Average Gallons Used: 16.5 Million
- Average Number of Irrigated Acreage: 103.3 Acres

#### Bunker Maintenance

### Bunkers Raked or Touched Up

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 Days–10 Clubs</td>
<td>10</td>
</tr>
<tr>
<td>4-6 Days–10 Clubs</td>
<td>10</td>
</tr>
<tr>
<td>Daily–6 Clubs</td>
<td>6</td>
</tr>
</tbody>
</table>

Bunker primarily raked by hand: 15
Mechanical: 22

Clubs that installed bunker liners in renovation: 13

Year of most recent bunker renovation:
- Oldest: 1990
- Newest: 2018
- Average: 2010

35 Clubs have reported bunker renovations since the year 2000.
Rounds of Golf

2016

<table>
<thead>
<tr>
<th>Rounds</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4,200</td>
<td>16,667</td>
<td>32,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2008

<table>
<thead>
<tr>
<th>Rounds</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9,000</td>
<td>17,585</td>
<td>34,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Average Rounds 2016

| Rounds | 10,633 | 13,690 | 14,035 | 17,949 |

Lightning Detection Equipment

- Yes 25 No 12
- Automated 22
- Manual 2
- Other 0

Do you close your greens and use temporary greens during Winter?

- Yes 17 No 22

If you close your greens do you cover them?

- Yes 17 No 22

Practice Facilities

- Full Club Selection 32
- Limited Club Selection 4
- Short Game Area 31
- Artificial Mats 19
- Multiple Practice Greens 16
- Heated Teaching Center 6
- Additions to Practice Area 8
- Modifications to Practice Area 7
- No Additions or Modifications 22

Management of Ornamental Plantings and Trees

- Ornaments Removed 10
- Trees Removed 32
- No Change 3
- Added Ornaments 10
- Added Trees 7

Tree removal continues to be one of the top trends in tree management.

Tree Management in Place for 2018?

- Yes 26 No 12
- Budgeted Line Item 15 No 24
- Tree Inventory List 10 No 28

Maintenance Building

Average Year Since Last Maintenance Building Renovation:

- 1960
- 1970
- 1980
- 1990
- 2000
- 2010
- 2020

Lightning Detection Equipment

- Yes 3 No 35

Do you have equipment washing station that recycles or filters waste water?

Technology

- Drones 10
- Robotic Mowers 1
- GPS Sprayers 8
- On-site Weather Stations 18
- Hand Held Soil Thermometers or EC Meters 15
- In-Ground Temperature Sensors 6
- Hand Held Moisture Meters 21
- Other 2

Aeration

Month in which fall aeration is done:

- August – 13
- September – 15
- October – 15
- November – 1

Averages are made of the number of times a club employs a practice, zeros are not counted.

Top Dressing

- Average Top Dressing Expenditure $6,250 $12,630 $22,526 $43,666
- Average Number of Applications 2.9 8.7 13.11 16.6

Do you top dress fairways?

- Yes 12 No 25

Only three clubs in groups 1 & 2 and only two clubs in group 3 reported top dressing their fairways.
### Aerification Programs

#### Coding for categories:

- **Group 1** — $430,000 & Below Annual Operations Budgets - 7 Clubs
- **Group 2** — $500,000 – $840,435 Annual Operations Budgets - 10 Clubs
- **Group 3** — $898,437 – $1,200,000 Annual Operations Budgets - 9 Clubs
- **Group 4** — $1,290,858 & Above Annual Operations Budgets - 12 Clubs

#### 2019

##### Putting Greens

<table>
<thead>
<tr>
<th>Core</th>
<th>Drill &amp; Fill</th>
<th>Deep Tine</th>
<th>DryJect</th>
<th>Verticut</th>
</tr>
</thead>
<tbody>
<tr>
<td>■</td>
<td>1.5</td>
<td>.17</td>
<td>.0</td>
<td>0</td>
</tr>
<tr>
<td>▲</td>
<td>1.5</td>
<td>0.1</td>
<td>0.8</td>
<td>.03</td>
</tr>
<tr>
<td>●</td>
<td>1.89</td>
<td>.11</td>
<td>1311</td>
<td>.56</td>
</tr>
<tr>
<td>★</td>
<td>2.17</td>
<td>.17</td>
<td>1.71</td>
<td>.25</td>
</tr>
</tbody>
</table>

##### Approaches

<table>
<thead>
<tr>
<th>Core</th>
<th>Drill &amp; Fill</th>
<th>Deep Tine</th>
<th>DryJect</th>
<th>Verticut</th>
</tr>
</thead>
<tbody>
<tr>
<td>■</td>
<td>0.83</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>▲</td>
<td>1.4</td>
<td>0</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>●</td>
<td>1.78</td>
<td>0</td>
<td>0.44</td>
<td>0.56</td>
</tr>
<tr>
<td>★</td>
<td>1.83</td>
<td>0</td>
<td>0.92</td>
<td>0.25</td>
</tr>
</tbody>
</table>

##### Tees

<table>
<thead>
<tr>
<th>Core</th>
<th>Drill &amp; Fill</th>
<th>Deep Tine</th>
<th>DryJect</th>
<th>Verticut</th>
</tr>
</thead>
<tbody>
<tr>
<td>■</td>
<td>1</td>
<td>0</td>
<td>0.17</td>
<td>0</td>
</tr>
<tr>
<td>▲</td>
<td>1.2</td>
<td>0</td>
<td>0.1</td>
<td>0</td>
</tr>
<tr>
<td>●</td>
<td>1.44</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>★</td>
<td>1.83</td>
<td>0</td>
<td>0.42</td>
<td>0.17</td>
</tr>
</tbody>
</table>

##### Fairways

<table>
<thead>
<tr>
<th>Core</th>
<th>Drill &amp; Fill</th>
<th>Deep Tine</th>
<th>DryJect</th>
<th>Verticut</th>
</tr>
</thead>
<tbody>
<tr>
<td>■</td>
<td>0.83</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>▲</td>
<td>1.1</td>
<td>0</td>
<td>0.1</td>
<td>0</td>
</tr>
<tr>
<td>●</td>
<td>1.28</td>
<td>0</td>
<td>0.22</td>
<td>0</td>
</tr>
<tr>
<td>★</td>
<td>0.92</td>
<td>0</td>
<td>0.42</td>
<td>0</td>
</tr>
</tbody>
</table>

##### Roughs

<table>
<thead>
<tr>
<th>Core</th>
<th>Drill &amp; Fill</th>
<th>Deep Tine</th>
<th>DryJect</th>
<th>Verticut</th>
</tr>
</thead>
<tbody>
<tr>
<td>■</td>
<td>0.33</td>
<td>0</td>
<td>0</td>
<td>1.67</td>
</tr>
<tr>
<td>▲</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>●</td>
<td>0.22</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>★</td>
<td>0.17</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

##### Aeration

<table>
<thead>
<tr>
<th>In House</th>
<th>Contract</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>■</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>▲</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>●</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>★</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

##### Natural Areas

<table>
<thead>
<tr>
<th>Total Areas</th>
<th>Increase</th>
<th>Decrease</th>
<th>Same</th>
</tr>
</thead>
<tbody>
<tr>
<td>■</td>
<td>5.3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>▲</td>
<td>14.7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>●</td>
<td>57.7</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>★</td>
<td>26.5</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>
The Association and the Green Committee thank the area superintendents chapters for their support.

GREATER PITTSBURGH GOLF COURSE SUPERINTENDENTS ASSOCIATION
P.O. Box 262
Bridgeville, PA 15017
E-mail: GPGCSA@comcast.net
Phone: 412-838-7920
Administrator: Michelle Shaw
President: Andy Bates, Hickory Height GC
Website: gpgcsa.org

MOUNTAIN & VALLEY GOLF COURSE SUPERINTENDENTS ASSOCIATION
P.O. Box 550
Boalsburg, PA 16872
E-mail: mvgsca1989@gmail.com
Phone: 814-280-5183
Executive Director: Pam Asencio
President: Carl Michael, Jr., Down River GC
Website: mvgsca.org

NORTHWEST PENNSYLVANIA GOLF COURSE SUPERINTENDENTS ASSOCIATION
P.O. Box 157
Frostville, PA 16035
E-mail: nwpgcsa@zoominternet.net
Phone: 724-421-7588
Executive Secretary: Julie Powell
President: Kyle Woodfield, Whispering Woods GC
Website: nwpgcsa.com

ELLIOTT DOWLING, USGA GREEN SECTION, NORTHEAST REGION AGRONOMIST
644 E. Cyrus Street
Kennitt Square, PA 19348
E-mail: edowling@usga.org
(C) 908-326-1907

CHASE ROGAN, FIELD STAFF, MID-ATLANTIC REGION GOLF COURSE SUPERINTENDENTS ASSOCIATION OF AMERICA
1421 Research Park Drive
Lawrence, KS 66049
E-mail: crogan@gcsaa.org
785-832-3609 Direct
814-241-3037 Cell
Website: gcsaa.org

Maintenance staff at Nevillewood prepares for U.S. Open Qualifying
Topdressing the widest fairway in Western Pennsylvania.

The sun peaks through the fog in the early morning at the Pittsburgh Field Club.

Laying of Poa Annua sod on #15 cut from #16, Sewickley Heights.

Greens mix being added to #17 at Sewickley Heights.

2018-2019 WPGA Green Committee

Ken Flisek, Nevillewood
Chairman

Jason Batchelor, Moon

Bob Davis, Chartiers

Elliott Dowling, USGA

Tim Fitzgerald, Oakmont

Jason Hurwitz, Fox Chapel

Dan Johnston, Treasure Lake

David Malatak, Sewickley Heights

Eric Materkowski, St. Clair

Randy McCombs, Fox Chapel

Carl Michael, Jr, Down River

Ron Moehler, Chartiers

Tom Reading, Fox Chapel

Mary Beth Morrissey, Connoquenessing

Chase Rogan, GCSAA

Josh Saunders, Longue Vue

Bill Stowers, Westmoreland

Rud Van Horn, Hickory Heights