



NEW YORK STATE
BEST MANAGEMENT
PRACTICES
PRE-ASSESSMENT QUIZ
RESULTS

Introduction

As part of the New York State Best Management Practices (NYS BMP) project, New York State golf course superintendents and Cornell University created a quiz and assessment survey to test superintendents and others involved in the golf industry on their level of knowledge and implementation of BMPs on the state's golf courses. The BMP quiz and assessment survey were designed to achieve a number of goals:

- to provide verifiable evidence for NYS regulatory agencies that a majority of New York State golf course superintendents are utilizing the NYS BMP information
- as an educational tool to assist superintendents in identifying areas for potential improvement in their golf course management operations
- to encourage the use of the NYS BMP materials by identifying which topics are of greatest relevance
- to design an educational program that meets the needs of superintendents and assistant superintendents based on an analysis of the results

Superintendents throughout the state were asked to take both the pre-assessment quiz and survey during the survey period from December 10, 2015 through March 15, 2016. This report details the responses of the people who completed the pre-assessment quiz.

BMP Pre-Assessment Quiz Results

The pre-assessment quiz was designed to provide the survey respondents a better understanding of the environmental concepts fundamental to BMPs, as presented in the Best Management Practices for New York State Golf Courses web site (<http://nysgolfbmp.cals.cornell.edu/>). The quiz covered the following topics:

- hydrology
- soils
- fate and transport mechanisms
- water quality issues

Overall, 165 people completed the pre-assessment. A majority (129) reported having received an email from a NYS superintendent with the link to the quiz. The New York State Turf Association (NYSTA) also sent out emails with a link to the survey; 27 respondents had received an email from NYSTA about the quiz, 13 of whom did not report receiving an email from a NYS superintendent. 26 people reported having learned of the quiz during an in-person presentation; and a few also reported having seen links in a social media post.

Demographic Information

Out of the 165 completed quizzes, 145 respondents (88%) represent a NYS golf course. Of the 20 respondents not representing a NYS golf course, 14 were Superintendents or Asst. Superintendents. The remainder of the analysis is for NYS golf course representatives only.

Questions/Answers/Responses

The answers to each question are in bold. Partial points were allotted for questions with multiple answers. All questions, except for demographic questions, required answers. The number of total possible points was 29; the average score for NYS respondents was 23.4.

- Runoff and leaching are two fate and transport mechanisms that must be understood in order prevent off site movement of potential water quality contaminants. Select the true statement from the following:
 - Runoff is the unintended release of chemicals, such as fertilizers or pesticides, and results in a point source of contamination.
 - Runoff is the movement of water across the turf and soil surface.**
 - Runoff is the downward movement of water through soil.
 - Leaching is the movement of water across the turf and soil surface.

Answers:

Correct	126	87%
Incorrect	19	13%

Runoff is the unintended release of chemicals...	18
Runoff is the movement of water across the turf...	126
Runoff is the movement of water through soil.	1
Leaching is the movement of water across the turf...	

- Superintendents must adapt management programs that address nutrient and management needs that consider the effect of microclimates on the fate of applied materials (e.g. fertilizers and pesticides). Microclimates are created by: (select all that apply)
 - landforms**
 - soil type
 - vegetation**
 - water bodies**
 - geology

Answers:

All 3 Correct	13	9%
2 Correct Answers	2	1%
1 Correct Answer	16	11%
No Correct/Incorrect Answers	114	79%

landforms	134	92%
soil type	104	72%
vegetation	120	83%
water bodies	115	79%
geology	96	66%

3. Irrigation and evapotranspiration (ET) are part of the:

- turf cycle
- hydrologic cycle**
- life cycle
- chemical cycle

Answers:

Correct	142	98%
Incorrect*	3	2%

*3 incorrect answers were all "turf cycle"

4. If the moisture holding capacity of soil is at saturation point, additional rainfall or water from irrigation is at risk to:

- percolate downward to groundwater
- become surface runoff**
- evaporate

Answers:

Correct	140	97%
Incorrect*	5	3%

*5 incorrect answers were all "percolate downward to groundwater"

5. The amount of runoff versus infiltration at any location varies seasonally. In New York State, the greatest likelihood for surface runoff from turf most often occurs:

- in the summer, during peak periods of irrigation
- in the late fall, when evapotranspiration rates decrease and groundwater is recharging
- in the late winter/early spring, when the ground may be near saturation or soils may be partially frozen**
- in the middle of winter, when snow covers the ground

Answers:

Correct	137	94%
Incorrect	8	6%

In the summer...	5
In the late fall...	3
In the late winter/early spring...	137
In the middle of winter...	0

6. The field capacity of soil is the amount of water that remains after gravity has exerted its influence on water and depends primarily upon the following characteristics:
- soil structure, pH, vegetation type
 - soil structure, pH, and climate
 - soil structure, texture and organic matter**
 - soil texture, pH, and amount of irrigation
 - soil texture, organic matter, and amount of irrigation

Answers:

Correct	120	83%
Incorrect	25	17%

soil structure, pH, vegetation type	0	0
soil texture, pH, and amount of irrigation	1	1%
soil structure, texture and organic matter	120	83%
soil structure, pH, vegetation type	5	3%
soil structure, pH, and climate	2	1%

7. The greatest potential for groundwater contamination occurs on sites with the following characteristics:
- soils with hardpans
 - finer textured horizons in the subsoil
 - sandy soils that overlay an impermeable layer
 - sandy soils that overlay porous materials with a shallow water table**

Answers:

Correct	132	91%
Incorrect	13	9%

sandy soils that overlay porous materials with a shallow water table	132	91%
soils with hardpans	9	6%
sandy soils that overlay an impermeable layer	2	1%
finer textured horizons in the subsoil	2	1%

8. The potential for surface runoff contamination increases on sites with specific characteristics. Which of the following site characteristics can increase the likelihood of surface runoff: (select all that apply)

- saturated soils**
- sandy soils
- compacted soils**
- proximity to a water body
- on steep slopes**
- soils high in clay particles**
- soils with large pores
- soils with small pores**

Answers:

All 3 Correct	101	70%
2 Correct Answers	0	
1 Correct Answer	0	
No Correct/Incorrect Answers	44	30%

saturated soils	143	99%
sandy soils	0	0%
compacted soils	143	99%
on steep slopes	141	97%
soils high in clay particles	130	90%
soils with large pores	2	1%
soils with small pores	114	79%

9. Highly soluble compounds are more prone to reach water via the fate and transport mechanism of:

- runoff
- leaching**
- drift
- volatilization

Answers:

Correct	101	70%
Incorrect	44	30%

runoff	39	27%
leaching	101	70%
drift	2	1%
volatilization	2	1%

10. Which of the following can be potential point source pollution issues originating from storage and maintenance facilities? (select all that apply)

- runoff after a rainstorm that immediately follows a nutrient or pesticide application
- the transportation, storage, or handling of pesticide or fertilizers**
- drainage discharge outlets**
- equipment washing areas**

Answers:

All 3 Selected	54	37%
All 3 Not Selected/Incorrect Selection	91	63%

runoff after a rainstorm that immediately follows a nutrient or pesticide application	49	34%
the transportation, storage, or handling of pesticide or fertilizers	86	59%
drainage discharge outlets	91	63%
equipment washing areas	132	91%

11. New York state law prohibits the use of phosphorus-containing fertilizers with a phosphate (P_2O_5) content greater than 0.67%, unless: (select all that apply)

- it is applied between the months of December 1st and April 1st
- the fertilizer is applied on previously established turf
- the fertilizer being used is an organic compost**
- soil tests show a phosphorus deficiency**
- establishing new turf**

Answers:

All 3 Selected	20	14%
All 3 Not Selected/Incorrect Selection	125	86%

it is applied between the months of December 1st and April 1st	3	2%
the fertilizer is applied on previously established turf	3	2%
the fertilizer being used is an organic compost	29	20%
soil tests show a phosphorus deficiency	126	87%
establishing new turf	111	77%

12. ___ may be the single most important strategy to protect water bodies from the impact of potential pesticide runoff.

- application timing
- pesticide selection
- vegetated buffers**
- management zones

Answers:

Correct	62	43%
Incorrect	82	57%

vegetated buffers	62	43%
application timing	70	48%
management zones	7	5%
pesticide selection	5	3%

13. NYS Department of Health does not allow chemical storage or mixing and loading facilities within ___ feet of a potable well.

- 25 feet
- 50 feet
- 100 feet**
- 250 feet

Answers:

Correct	85	59%
Incorrect	60	41%

25 feet	14	10%
50 feet	10	7%
100 feet	85	59%
250 feet	36	25%

14. prevention BMPs: (select all that apply)

- prevent or preclude the possibility of movement of sediment, nutrients, or pesticides**
- do not include the use of management zones
- include BMPs for irrigation, nutrients, pests, and cultural practices**

Answers:

Correct	98	68%
Incorrect	47	32%

prevent or preclude the possibility of movement of sediment, nutrients, or pesticides	111	77%
do not include the use of management zones	9	6%
include BMPs for irrigation, nutrients, pests, and cultural practices	138	95%

15. An Integrated Pest Management (IPM) approach: (select all that apply)

- emphasizes prevention of pest problems**
- does not include preventive pesticide applications
- considers economic as well environmental and health concerns**
- allows lower quality turf if beneficial to the environment

Answers:

Correct	48	33%
Incorrect	97	67%

emphasizes prevention of pest problems	113	78%
does not include preventive pesticide applications	20	14%
considers economic as well environmental and health concerns	130	90%
allows lower quality turf if beneficial to the environment	65	45%

16. The storage and handling of pesticides on golf courses: (select all that apply)

- presents the greatest risk to water quality contamination, of all golf course practices**
- is beyond the scope of BMPs
- cannot be done safely
- can be a point source of pollution to surface and/or ground waters**

Answers:

Correct	94	65%
Incorrect	51	35%

presents the greatest risk to water quality contamination, of all golf course practices	97	67%
is beyond the scope of BMPs	2	1%
cannot be done safely	0	0%
can be a point source of pollution to surface and/or ground waters	142	98%