Seminar Outline

1. *A brief introduction of the Weed Management*
2. *Type of Weeds*
3. *Type of Herbicides*
4. *Major weeds on Bermudagrass and Zoysiagrass and control*
5. *Major weeds on Seashore paspalum and control*
6. *Question & Answer*

1) A brief introduction of the weed management

- *Golf Courses turfgrass quality are: uniformity, density, smoothness, texture and color*
- *Weed: a 'Plant' growing where it is not wanted and disrupt the turf uniformity*
- *For example, seashore paspalum is considered a weed when grown in a pure turf stand of bermudagrass*

1) A brief introduction of the weed management (con't)

Symptomatic of a weakened turf, not the cause;

Reasons for weak or bare turf areas includes:

a) Improper selection of turf species not adapted to local environmental conditions

1) A brief introduction of the weed management (con't)

b) Damage from pest

(eg. Insects, nematodes, diseases and animals)

1) A brief introduction of the weed management (con't)

c) Environmental stresses such as excessive shade, drought, heat and cold

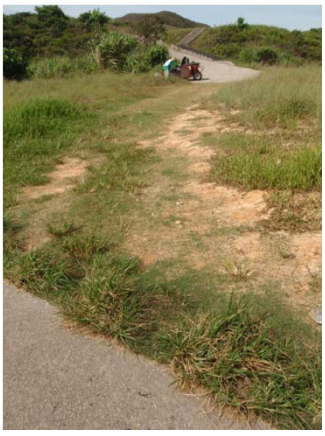
1) A brief introduction of the weed management (con't)

d) Improver turf management practices

(eg. lack of aeration, improver mowing height)

1) A brief introduction of the weed management (con't)

e) Physical damage and compaction from concentrated traffic



1) A brief introduction of the weed management (con't)

- ***Opportunist, invade turf area by seeds, vegetatively, or both***
- ***Dispersal of weed seeds or propagules by wind, surface water movement, animals (eg. Birds), irrigation water and the activities of human by movement***
- ***Control of weeds need the knowledge of the problem weeds life cycles***

1) A brief introduction of the weed management (con't)

Develop a Weed Management Program

An integrated process where good cultural practices are employed to encourage desirable turfgrass ground cover and the proper use of herbicides.

1) A brief introduction of the weed management (con't)

A successful approach involves:

a) Proper weed identification

b) Prevention of weed introduction

c) Proper turfgrass management or cultural practices

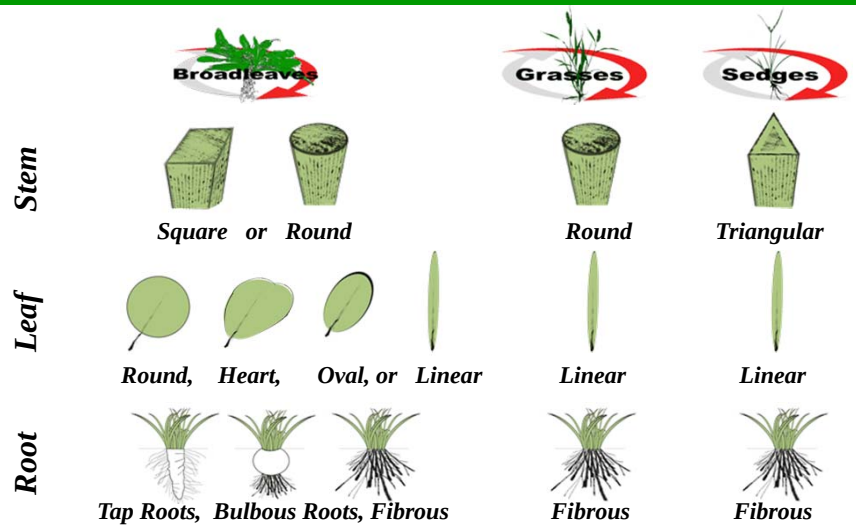
d) If necessary, the proper selection and use of herbicide

e) Understand the local weather pattern

2) Type of Weeds

- ***Weeds describes as annuals, biennials and perennials***
- ***Weeds also differentiated by the types and natures to herbicides***

2) Type of Weeds (con't)



2) Type of Weeds (con't)

PART I: Grasses Weeds

Features: Monocotlyedons, with parallel veins extending longitudinally in the leaves of grassy weeds.

2) Type of Weeds (con't)

PART II: Sedges

Features:

Monotolyedons, with stem in either triangular shaped and solid and usually with waxy texture

Removal of sedges and grassy weeds from desirable perennial turfgrasses is very difficult because of the similarities between the species

2) Type of Weeds (con't)

PART II: Sedges (con't)

Purple Nutsedge

Yellow Nutsedge

Kyllinga

2) Type of Weeds (con't)

PART III: Broadleaves Weeds

Features: Dicotlyedons, with netted vein system and usually have colorful flowers

3) Type of Herbicide

- Classified according to chemistry, method of application, timing of application, persistence, selectivity, and mode of action
- Selective (選擇性) vs Non selective(全殺型)
- Systemic (傳導型) vs Contact (觸殺型)
- Preemergence (PRE) 芽期除草劑 vs Postemergence (POST)芽後除草劑

3) Type of Herbicide (con't)

Preemergence Herbicides

- Oxadiazon
- Prodiamine

Postemergence Herbicides

- MSMA
- Trifloxysulfuron
- Imazaquin
- 2,4-D,dicamba
- Bentazon
- Quinclorac

4) Major weeds on Bermudagrass & Control

a) Crabgrass (*Digitaria spp.*) (*馬唐*)

- Pre emergent herbicide: oxadiazon or prodiamine, apply when soil temperature above 15^{o} C (in late Feb – March)
- Post emergent herbicide: use 'MSMA/ quinclorac (apply in May – Aug/Sept) at repeated applications

4) Major weeds on Bermudagrass & Control (con't)

b) Goosegrass (*Eleusine indica*) (

- The most problem weed in HK
- Pre-emergent herbicide: use 'oxadiazon' or prodiamine, germination usually follow 2 weeks behind crabgrass when soil temperature at 20^{o} C
- Seed Quantity/plant : 50,000-135,000

4) Major weeds on Bermudagrass & Control (con't)

b) Goosegrass (Eleusine indica)

- Post emergent herbicide: use MSMA/DSMA, but ususally successful when plant at 2-4 leaves blades. Hand removal usually required when getting larger.

4) Major weeds on Bermudagrass & Control (con't)

c) Torpedograss (*Panicum repens*) (鋪地黍)

- Very problematic perennial creeping grass, with strong and extensive rhizome
- Avoid movement of contaminated soil

4) Major weeds on Bermudagrass & Control (con't)

c) Torpedograss (*Panicum repens*) (鋪地黍) (con't)

- Post emergent herbicide: use quinclorac / bentazon with repeated application (May – Sept). Also use of 'Glyphosate' for non-selective post emergence control.

4) Major weeds on Bermudagrass & Control (con't)

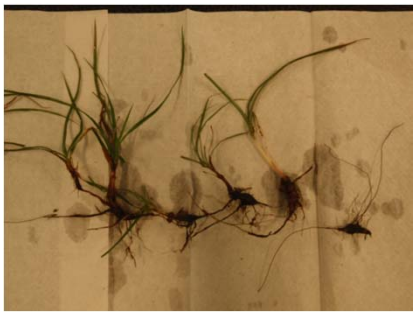
d) Sedges (沙草科)

- Yellow nutsedge, purple nutsedge, Kyllinga (水蜈蚣)
- Pre-emergent herbicide: use 'oxadiazon' or prodiamine to prevent seeds germination in hot spots (late Feb – March)

4) Major weeds on Bermudagrass & Control (con't)

d) Sedges (沙草科) (con't)

- Post emergent herbicide: use 'Trifloxysulfuron / imazaquin/MSMA/ bentazon (April – Sept)



	Yellow nutsedge	Purple nutsedge
Type of plant:	Sedge	Sedge
Life cycle:	Perennial	Perennial
Growth habit:	Spreading	Spreading
Aggressiveness (1-10 scale;10=most aggressive):	10	8
Leaf attachment:	3 ranked	3 ranked
Leaf color:	Dark Green	Medium Green
Flower description:	Indistinguishable to the naked eye	Indistingulishable to the naked eye
Seed description:	Seedhead - Purple Color	Seedhead - Yellow Color
Reproduces by:	Rhizomes, tubers	Seed, rhizomes, tubers
U.S. states found in:	Warmer Climates - North to KY and west to southern CA	Throughout North America
Countries found in:	Mexico, Central & South America, Europe, Africa	Central & South America, Europe, Africa
Golf course areas found in:	Tees, Fairways, Roughs, Low Maintenance areas	Roughs, Low Maintenance areas

4) Major weeds on Bermudagrass & Control (con't)

e) Broadleaves

- Pre-emergent herbicide: use 'oxadiazon' or prodiamine to prevent seeds germination in hot spots
- Post emergent herbicide: use trifloxysulfuron,'2,4-D, dicamba' / MSMA/ quinclorac/bentazon

5) Major weeds on Seashore Paspalum & Control

- Prevention of weeds germination is very critical
- Pre-emergent herbicide: use ‘oxadiazon’ or prodiamine to prevent seeds germination in hot spots
- Post emergent herbicide: use ‘2,4-D, dicamba’ / quinclorac/ bentazon
- Use of salt

5) Major weeds on Seashore Paspalum & Control (con’t)

5) Major weeds on Seashore Paspalum & Control (con't)

- **Apply 'Glyphosate' on spot for more 3-4 times (for 6 -8 weeks)**

5) Major weeds on Seashore Paspalum & Control (con't)

- **Manual removal and re-sodding (very expensive**

5) Major weeds on Seashore Paspalum & Control (con't)

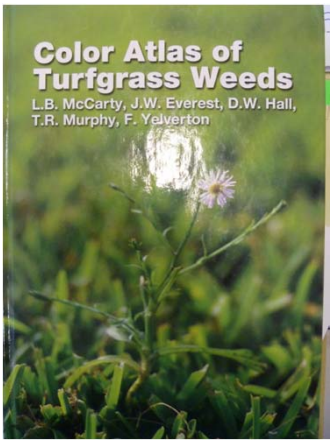
- **Distract the appearance and uniformity**



Major Challenges in weeds control in HK

- Spring transition is difficult (various with turfgrass species)
- Short window for weeds control (April – Sept)
- Wet summer affect the timing of herbicides application (eg. Follow up application)
- Pesticides registration to newer and safer products

Reference


Color Atlas of Turfgrass Weeds
L.B. McCarty, J.W. Everest, D.W. Hall, T.R. Murphy, F. Yelverton


Basagran
Roundup PRO
TARGET 6 Plus
SUPER TRIMEC
BROADLEAF HERBICIDE
Oxadiazon 2G
Prodiamine
Monument


Thank You