



WEED CONTROL AND APPLICATION

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Weeds in Turf

Golf courses present a unique environment for weeds

- **highly maintained areas encourage weed growth**
- **resource- rich environment**
- **monoculture**
- **Weeds closely resemble turfgrass**



Weeds in Turf: Patalot and Paller, 1998



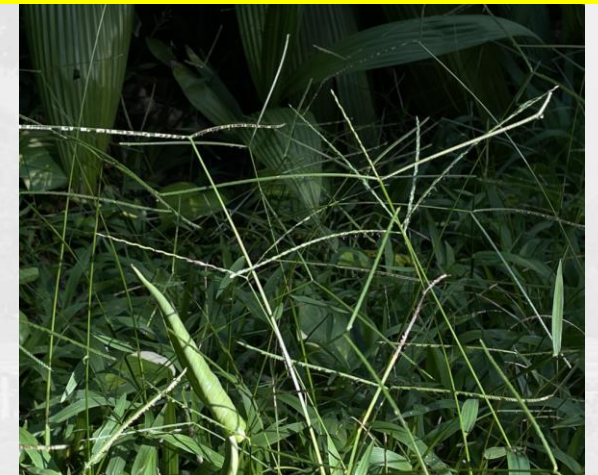
Purple nutsedge (*Cyperus rotundus*)



Goosegrass (*Eleusine indica*)



Sour paspalum (*Paspalum conjugatum*)



Study of Patalot and Paller, 1998

- **Purple nutsedge – was common to both greens and fairways in 5 golf courses**
- **Goosegrass - predominant weed in the greens in two of the five golf courses; and four of the five golf courses in the fairways**
- **Sour paspalum was common in the greens and fairways in two of the five golf courses**

Common Grass Weeds in Turf



crabgrass



Torpedo grass



goosegrass



Crowfoot grass



Cogon grass

Common sedge weeds



Kyllingia (green and white)



Purple nutsedge



Scirpus grossus

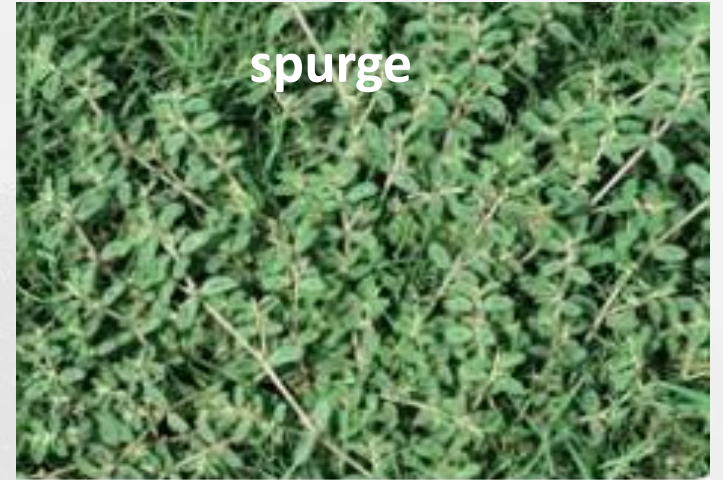
Broadleaf weeds



dandelion



Alysicarpus



spurge



Pseudoelephantopus
spicatus



Oxalis

Morphological Classification Weeds

- **Grasses**

- Cylindrical hollow stem
- Alternate leaf arrangement
- leaf originate from the nodes

- **Sedges**

- Triangular solid stem
- rosette leaf arrangement
- No nodes & internodes

- **Broadleaf – expanded leaf blade**

Annual vs Perennial

- **Annual**
 - **short-lived; life cycle is < 60 days; reproduced thru seeds**
- **Perennial**
 - **able to live from year to year**
 - **Possess vegetative propagule**

Management of Weeds in Turf

- **Cultural practices are really to take care of the turf**
- **Frequent mowing leads to reduced growth but tougher leaves and stem**
- **Availability of moisture = conducive environment**
- **Manual weeding for deeply rooted plants**

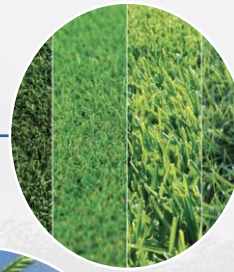
Herbicides Used in Turf

- **Should be selective against problem weeds and safe on the turf (no injury)**
- **Can be applied PRE or POST**
- **Window of application????**

Herbicides Used in Turf

Active Ingredient	Timing of Application	Target weeds	Movement	HRAC category	Mode of Action
1. 2,4-D	POST	Broadleaf; some activity of sedge	Translocated	Grp 4	Auxin mimic
2. MSMA	POST	Perennial grasses	Contact	Unknown	unknown
3. Halosulfuron	POST	Broadleaf and sedge (nutsedge)	Translocated	Grp 2	ALS
4. Quinchlorac	POST	Grasses; broadleaf	Translocated	Grp 4	Auxin mimic
5. Fluazifop-butyl	POST	Annual and perennial grasses	Translocated	Grp 1	ACCCase
6. Flazasulfuron	PRE/POST	Grasses, sedge, broadleaf	Translocated	Grp 2	ALS
7. Metribuzin	PRE/POST	Grasses & broadleaf	Translocated	Grp 5	PS II inhibitor
8. Atrazine	PRE/POST	Grasses & broadleaf	Translocated	Grp 5	PS II Inhibitor
9. Bentazon	POST	Broadleaf & sedge	Contact	Grp 6	PS II inhibitor
10. MCPA	POST	Broadleaf & Sedge	Translocated	Grp 4	Auxin mimic

Herbicide choice and Application Method



Turf species



Problem weeds

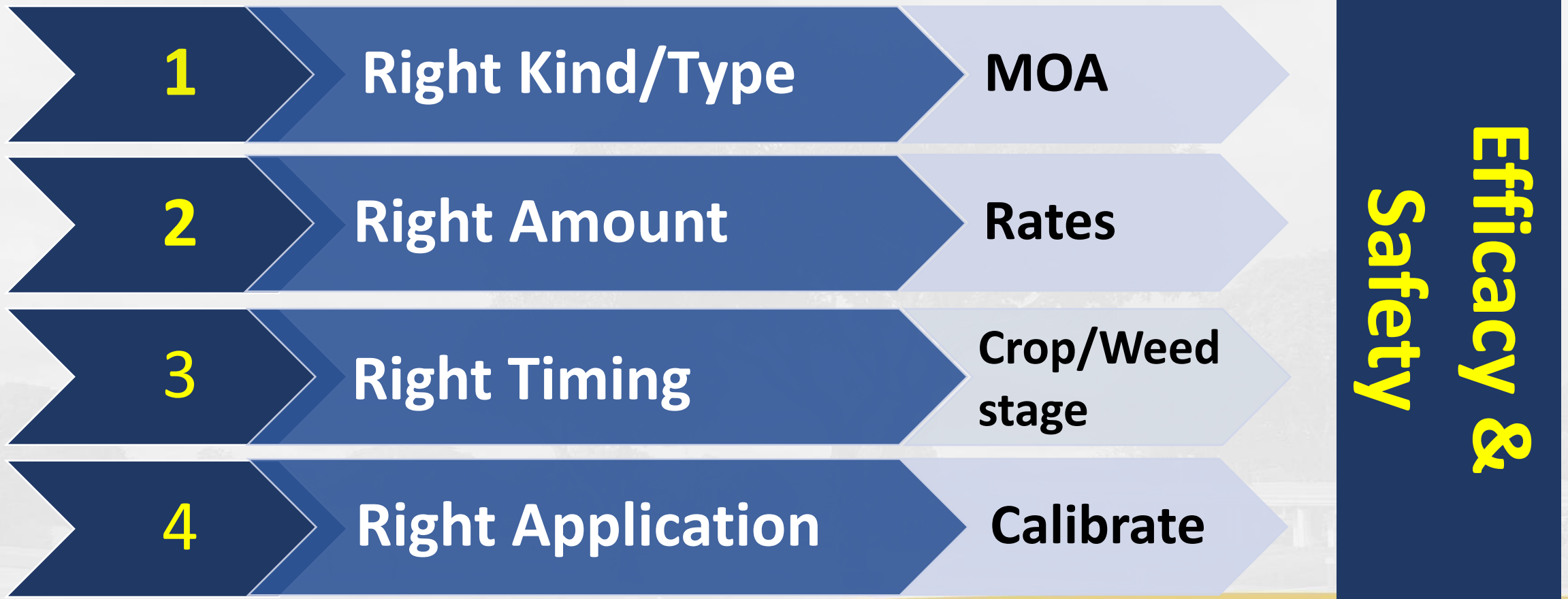


Weather
conditions



Weed density &
distribution

Responsible Use of Crop Protection Products (4Rs)



Current Initiatives on Turf Grass Research and Instruction

- Weed and turfgrass response to various herbicide programs
- Major practice for undergraduate students in turf management
- Institution of an undergraduate course on Weed Management in Turf



Future Initiatives

1. Book on Pest and Pest Management in Turf
2. DNA Barcoding of turf grasses and weeds
3. Occurrence and confirmation of herbicide resistance in weed populations in turf.
4. Trainings

Thank you

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