Turf insect and weed management update
Velocity (bispyribac)

- New herbicide chemistry from Valent; closely related to sulfonylureas
- Poa control on fairways: rye overseeded and bentgrass. Not for use on greens
- Use only 1/1 – 3/15, but not if <50F
- 2 applications of 1.3 oz/A best results
- Comparable to 2 applications Prograss
- Not registered: SLN in FL, GA, MI, NC, NJ, SC, TX
Quality of ryegrass overseeded fairways after Velocity applications
Pelican Hill GC, Newport Coast CA   3/23/04

Applications made 1/28, 2/12, 2/27
No treatment vs. Velocity 1.3 oz/A (2 applications)
Velocity
2.6 oz/A vs. 1.3 oz/A
Prograss 1.3 ga/A vs. Velocity 1.3 oz/A
Trimmit 2 SC
(paclobutrazole)

- Syngenta growth regulator; registered in most of U.S., but not CA (yet)
- Used early post-emergence
- Reduces competitive ability of Poa annua on bentgrass greens and overseeded fairways; but no seedhead suppression
- Poa shoots and leaves become discolored
- Effects seen 1 - 2 weeks after treatment; lasts 3 – 8 wks
Trimmit 2SC on bentgrass greens

- **6.4 oz – 16 oz/A**
- 2 -3 applications, spring and fall, 3 - 4 wks apart
- New greens with low Poa infestations optimal
- Multiple years required for control
- Best performance inland where bentgrass is more competitive
Trimmit 2SC on bentgrass green
Poppy Ridge GC, Livermore, CA

Photo courtesy Mark Mahady and Syngenta
Differential suppression
Trimmit 2SC on overseeded fairways

- Apply after overseed has established (85%) cover
- 8 oz/A; 3 monthly applications: ~80% control
- Increased control (~90%) if Primo (13 oz/A) applied at first mow
- Comparable to Prograss control
- Bermudagrass is 3-4X more sensitive than Poa, so avoid when bermuda growth is desirable
Trimmit 2SC (3 applications) on overseeded fairways
Indian Wells CC, Indian Wells, CA
Prograss (2 applications) on overseeded fairways
Indian Wells CC, Indian Wells, CA

Prograss
0.5 gal/A
Applied 2X
12/15 & 1/16

4/8/04
Poa control with Trimmit, Prograss and Primo
Indian Wells CC. April 8 rating

- Control
- Primo: 2 apps
- Trimmit: 3 apps
- Primo+Trimmit
- Prograss: 2 apps (0.5ga/A)
RoundUp Ready® creeping bentgrass is not approved for sale or distribution in the United States. Roundup PRO® herbicide is not registered for this use. It is a violation of federal law to promote any unregistered herbicide use.
Reduced inputs should result in:

- Herbicides (pre-emergent, post-emergent)
- Fungicides (anthracnose, summer patch, bacterial wilt)
- Insecticides (annual bluegrass weevil in Northeast)
- Nematicides (*Anguina pacifica* nematode on *Poa* in affected areas)
- Growth regulators (control *Poa* seedheads)
- Fumigants (increase renovation success by eliminating weed issues)
- Labor for *Poa* and other weed management
- Improved playing conditions and aesthetics (uniformity)
Putting Green Cultivar Development

Penn A-4
$ Spot Susceptible

R-EDI
$ Spot Resistant
(Sister to A03-EDI in NTEP)
RR bent tolerance to Roundup PRO
(4X labeled rate)

No Roundup PRO®

4 gallons/A
2 gallons/A
1 gallon/A
2 qt / A
1 qt / A

Results of field trials conducted at Marysville, OH, Oct. 2001
Regulatory status

USDA: environmental risks
• formal petition for deregulation submitted April, 2003. Summary of over 25 experiments, 70 environments to examine potential risks
• Outcrossing to 13 weed species possible; BLM, USFS, Corps of Engineers have some concerns
• No issues of major concern regarding increased risk over conventional bentgrass (Scotts/Monsanto)
• 2005 is likely date for decision on deregulation

FDA: feed safety
• September 23, 2003 – no difference from other bentgrass

EPA: Herbicide label for Roundup on bentgrass greens
• submitted to EPA in May 2002 for use of Roundup on RRB.
Avoiding Herbicide Mix-Ups
Why it happens

- Commercial names sound alike
- Commercial name not recognized
- Label art is similar
- Storage of herbicides next to other products
- Fertilizers impregnated with herbicides mixed up with plain fertilizers
- Worker training is essential
Avoiding the problem:
Reading the product label

- **Commercial name**: AQUAMASTER™
- **Product type**: Herbicide by Monsanto
- **Common name**: Glyphosate, N-(phosphonomethyl)glycine
- **Chemical name**: in the form of its isopropylamine salt

**ACTIVE INGREDIENT:**
- 53.8%

**OTHER INGREDIENTS:**
- 46.2%

**Total**: 100.0%
AQUEDUCT®
SOIL SURFACTANT
Blended Non-ionic Soil Surfactant

AQUA MASTER™
Herbicide by Monsanto

ACTIVE INGREDIENT:
*Glyphosate, N-(phosphonomethyl)glycine,
in the form of its isopropylamine salt .................. 53.8%
OTHER INGREDIENTS: ..................................... 46.2%
100.0%
Avoiding the problem: Recognize the names of glyphosate-based herbicides

<table>
<thead>
<tr>
<th>Aqua-Neat</th>
<th>Kleen-Up</th>
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<tbody>
<tr>
<td>Aquamaster</td>
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<tr>
<td>Campaign</td>
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<td>Ranger</td>
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<td>Eagre</td>
<td>Rattler</td>
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<td>Glyfos</td>
<td>Razor</td>
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<td>RoundUp</td>
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<tr>
<td>Honcho</td>
<td>Silhouette</td>
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<td></td>
<td>Touchdown</td>
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</table>
Avoiding the problem: Separate storage areas

• Store herbicides in a separate cabinet or room from all other products
• At a minimum, specific shelves should be designated
Avoiding the problem: Check and double check

- Build a safety net
- Daily product selections approved by superintendent or surrogate
BILLBUGS

Adult billbug

Larval billbug (grub)
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<th>NAME</th>
<th>HOST PLANTS</th>
<th>GEOGRAPHY</th>
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<tr>
<td><em>Sphenophorus parvulus</em></td>
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<tr>
<td>Hunting billbug</td>
<td>Zoysia &amp; hybrid Bermuda. Occasionally bahia, centipede &amp; St. Augustinegrass</td>
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<tr>
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<td>Bermuda, zoysia and <em>kikuyugrass</em></td>
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Hunting billbug
*Sphenophorus venatus vestitus*
Phoenician billbug
*Sphenophorus phoeniciensis*
Phoenician billbug
Damage on kikuyugrass
Bermudagrass fairway
Symptoms first appear during spring greenup
Phoenician and hunting billbugs

- May be causing more damage than previously thought on kikuyu and bermudagrass fairways
- Grubs are damaging stage
- Symptoms of infestation during spring green-up, in stressed areas
- Symptoms similar to dollar spot, spring dead spot, drought stress
Management
Monitoring

- Little is known about life cycle; appear to present year-round in Southern California, but peak activity in spring/summer.
- Adults are early warning system: Monitor for adult activity in spring (>60F); cartpaths, bunkers, greens.
- Grubs will appear 2-4 weeks later.
- “Tug test”
- Pitfall traps
Control

- “Baby” turf with water, fertilizer; will grow out of light infestation
- Endophyte enhanced rye or fescue
- Contact insecticides against adults: must be applied at peak adult activity
- Preventive insecticides against grubs: 4 wks after adults detected.
- Rescue situation: carbaryl (Sevin) or imidacloprid (Merit) give moderate control
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## Key products for billbug control

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<th>Rate of AI</th>
<th>Control</th>
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<tbody>
<tr>
<td>bifenthrin</td>
<td>Talstar</td>
<td>0.8 – 1.6 oz</td>
<td>curative</td>
</tr>
<tr>
<td>chlorpyrifos</td>
<td>Dursban Pageant</td>
<td>1 lb</td>
<td>curative</td>
</tr>
<tr>
<td>cyfluthrin</td>
<td>Tempo</td>
<td>1.5 oz</td>
<td>curative</td>
</tr>
<tr>
<td>cyhalothrin</td>
<td>Scimitar</td>
<td>1.1 oz</td>
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</tr>
<tr>
<td>carbaryl</td>
<td>Sevin</td>
<td>8 lb</td>
<td>curative</td>
</tr>
<tr>
<td>halofenozide</td>
<td>Mach 2</td>
<td>2 lb</td>
<td>preventive</td>
</tr>
<tr>
<td>imidacloprid</td>
<td>Merit</td>
<td>6.5 oz</td>
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Rate of AI: per acre or per 1000 sq ft.
WHITE GRUBS

LARVAE = WHITE GRUBS
- Fat & soft bodied; ¼” – 1” long
- Usually in “C” shape
- 6 legs, no wings
- Hungry!
- Soil insects
- Re-infest the same areas
- White or transparent/gray with dark head

Masked chafer
Black turfgrass ataenius

LARVA (grub)  PUPA  CALLOW ADULT  ADULT
TIMING: European chafer: threat temperatures >70F

beetles: evening temps >65F (18C)

1st grubs at 70F (21C)
TIMING: Black turfgrass ataenius threat temperatures >65F

The Springs Club. Rancho Mirage, CA

First grubs