

- d. Clean rocks, stones and roots out of sand
- 5. Equipment Needs: Make sure you have what you need to complete tasks.
- 6. Tap into networks: GCSAA, Turf Students, Interns, Vendors, and Superintendents.
- 7. Fairway brushing can help ball sit up on turf.
- 8. When soil temperature are over 80 degrees at night, back off aggressive practices.
- 9. Slow greens are actually harder to play on than fast greens.
- 10. Green speed can influence set up.
- 11. Maintain fairway divot repair.
- 12. Use a piece of PVC to roll cup after installation.

Paul Vermeulen, Director of Competitions Agronomy for the PGA Tour made his presentation: "Putting Green Firmness For Competitive Golf." Paul joined the PGA Tour Staff in 2006 after working for the USGA as a Regional Agronomist for 20 years. "Competitive golf is much different than everyday golf. Surveys indicate players appreciate firmness and firmness can influence course strategy and scoring. Focus on firmness, not fast and eliminate fast from your vocabulary." In Paul's current job, he works for the players He has been compiling firmness data for the last two years at PGA Tour site courses.

So what is firm and what is soft?

When conditions are soft the players refer to the playability of the greens as "playing darts." They can hit shots right at the flag stick. When conditions are firm, they must hit in specific locations on the greens so the ball releases to the hole. Players are more challenged with firm conditions. If you watched the Presidents Cup at Royal Melbourne in Australia, those greens would be considered firm. "Faster greens allow the course to play easier. Slower greens are actually more difficult to play."

So how does one measure the firmness of greens? For the PGA Tour Paul uses a USGA Trufirm Meter. It operates on a Clegg hammer principal. It calculates the depression depth of a simulated ball impact. The formula is as follows: $h=1/2 (V1-V2) t$ h: height, V:velocity, t:time.

Paul collects the data for nine sites on each green. The data is downloaded into a data base with mapping features. The goal is to quantify firmness and to modify maintenance practices that will achieve more overall consistency.

Most people's perception is that Bermuda grass is firmer than bentgrass. This does not measure up. For some reason the Bermuda thatch is different than bent thatch and the bent greens typically measure to be firmer. "We don't have any specific targets, nor can firmness be manufactured on a daily basis." Information is used to avoid conditions that are inappropriate for the particular event.

Rainfall and irrigation are major factors influencing firmness. Firmness can be managed to some degree until nature decides otherwise. Start with the calendar and plan events around typical rain cycles. Some times of the year there is less chance for rain. Improving drainage can be helpful for achieving more firmness. Firmness comes with a price. It takes a lot of manpower for morning and afternoon rolling and judicious use of hand watering. It also takes a maintenance window outside of play.

A moisture meter can be of help to document soil moisture which affects overall firmness. Field data can be downloaded for mapping and analyzing purposes. A moisture meter will help quantify dry and wet areas on the greens. This can help to adjust irrigation scheduling for specific sites on the greens. Less volume with a higher frequency is more desirable for better firmness. A daily firmness target is irrational and not manufacturable. Consistent firmness takes record keeping, good help and luck. Paul wanted to emphasize "not just rolling to firmness."

Chuck Barber from St. Charles Country Club was the Moderator for a "PTI", point counter point discussion featuring Paul Vermeulen and Tim Moraghan on selected topics.

A summary of some of the comments:

- Organized teams have a better chance of producing the best playing conditions.
- The quality of the golf course makes the tournament event have a better chance for success.
- Green speeds are too fast today. PGA Tour average speeds are 11.
- Architects and course owners are building excessive and hard to maintain bunkers strictly as "eye candy."
- Future course designs will feature fewer bunkers and less numbers of ponds that will be easier to maintain.
- Advice for Superintendents over 50:
 1. Stay competitive, stay current
 2. Improve your communication skills
 3. Avoid Club politics – stay neutral
 4. Embrace social media
 5. Follow interests and don't be afraid to make changes
 6. It's not your course. Don't be possessive. **-OC**



Paul Vermeulen