Kristian Waagen, a Briton abroad reports from Meland Golf Club in Norway, where different problems require well thought out solutions

Against all odds

Life at Meland Golfklubb

Meland Golf Club is on the island of Holsnøy, on the west coast of Norway. Average rainfall in the region is about two to 2.5 metres each year. The average winter temperatures fall between 1.5°C and 3°C. The average summer temperatures fall between 10°C and 15°C. The highest summer temperature recorded was a staggering 30.1°C. The lowest winter temperature was minus16.7°C.

When I was considering the job at Meland back in 1997 I had some concerns about this information which I came across while researching the area on which the golf course was to be built. Questions pertinent to drainage and rootzone materials were forefront considering the amount of rainfall, also the low temperatures in the spring, which would take forever to warm heavy wet soils.

However, the interview process and openness of the Club Manager resolved many issues of concern and I accepted the job in November 1997. I moved my family from America and found myself supervising the final stage of construction, working closely with the Norwegian construction company, the Architect, and the club project development team.

Above right: The 16th tee, May 2000

Below: The Meland team with Kristian in white shirt

The real work began in earnest in the summer of 1998 as more and more of the course was seeded my two staff members and I juggled our time between overseeing construction and maintaining a developing golf course. We grew with the course and I made many observations in relation to soil conditions, fertiliser response, drainage, and the weather - observations that later were instrumental in developing the maintenance plans for the course. The course opened (well six holes anyway) in August of 1998 and was highly publicised throughout Norway. However, no tee times were taken that year upon my advice that the course was simply not ready to sustain play.

May 1999 saw the opening of the first nine holes with the second nine following later in August. The course was closed in October for the winter period and we opened all 18 holes in the end of April 2000. In November of 1999 we were listed as one of the Top 100 courses in Europe - although sneaking in at number 100.

Rainfall is without a doubt the main concern. Its impact, because of the sheer volume, cannot be ignored in the day-to-day management of the course. The staff are supplied with rain suits and work outside in all weathers to ensure the course is presented to a high standard at all times. The people from this part of the world do not stop what they are doing because it is raining, if they did they would never really do much at all! The golf course is therefore expected to be open at all times rain or shine which of course brings with it a host of problems in managing high traffic areas such as tees and greens.

Between April 1 and October 16 last year, despite receiving 31 inches of rain, we were only closed on four occasions, and on two of those we were open again by lunchtime.

The course is closed from mid October to the last weekend in April and sees intense play during the short summer season. During the mid-summer period when there are almost no hours of darkness you can see golfers out on the course from early morning to 11pm. The conditions and circumstances at Meland dictate its management as at any other course and the remaining article discusses some of that management. During the planning and construction of the course the weather was at the forefront of everyone's mind and a brief description of materials and techniques used is given here.

Tees

The tees are constructed on a solid base of blasted rock, having removed the peat down to bedrock. The subgrade was finished using crushed rock ensuring all large cavities were filled to prevent settling. A 10cm drainage layer was then installed using a 2-4mm pea gravel, and where necessary drain outlets were led away from the tee area and tied in with main drainage lines or natural water channels. The rootzone material used was the same as used in the greens. The specifications on the sand are to the recommended USGA specification and a composted material was added at the source prior to shipping. The ratio of sand to compost is 95 to 5 by weight. The blended mix was tested for percolation rates and the actual ratio was adjusted to give us the

required rates of percolation, which ended up at 177mm/hour. The finish depth of the root zone was 20cm. Tees are seeded with a blend consisting of the following:

20% Bargreen, Festuca rubra spp. commutata
25% Barcrown, Festuca rubra spp. litoralis
25% Enjoy, Festuca rubra spp. commutata
10% Highland, Agrostis castellana
10% Baron, Poa pratensis
10% Nugget, Poa pratensis

Greens

The same method of construction was used in building the greens and the tees. The difference being that in the greens we have a 30cm root zone depth as opposed to 20 cm as found in the tees. The greens are seeded with L-93 creeping bentgrass. This particular species was chosen for its natural resistance to many diseases specifically Fusarium, Typhula and leaf spot, that were typically the main concerns at other courses on the west coast of Norway.

Fairways and Semi Roughs

After much blasting, clearing, and filling these areas were finally capped with clay excavated on the site. Topsoil that was removed from the areas of the property that actually had any, was stock piled and blended with imported sand with particle sizing that ranged in size from 4 to 16 mm. The idea was to create a more freely draining soil. All the blending was performed at a central site and trucked out on to the course where it was then spread to a depth of 15cm over all areas that were to be maintained fairway and semi-rough. The fairways were shaped to move water away from play areas using contours, mounding, and swales. Drainage was installed extensively during the construction period with the knowledge that water had to be removed quickly from the surface to allow establishment and future management.

The fairways and Semi Roughs were seeded with the following blend:

25% Bargreen, Festuca rubra spp. commutata
20% Barcrown, Festuca rubra spp. litoralis
10% Highland, Agrostis castellana
30% Ryegrass, Lolium perenne
15% Baron, Poa pratensis

Course Management

Operating the golf course in typically wet conditions, with heavy play creates a lot of compaction in high traffic areas. Maintenance of the course under these conditions compounds the problem of compaction. The management of the course is centred therefore around aerification. We aerify everything and often.

Fairways

Fairways and semi roughs are aerified using a pull behind Aero-king 9672 either with hollow tines or knives, and a Charterhouse vertidrain. We hollow tine in the spring, mid April time, to open up the soil and assist with drying, with the idea of increasing soil temperatures more rapidly resulting in a jump on growth. Fertility is timed to coincide with this and if necessary damaged areas will be slit seeded. At this time I use a 15-0-0 ammonium nitrate fertiliser, supplemented with Ca and Mg. This is one of only two times I feel safe using such a readily available form of nitrogen as it is typically a stable period with almost no rain. From May to September we aerify with the knives each month running a different direction and to a depth of 10cm both in the fairways and semi roughs, with high traffic areas receiving extra attention. The vertidrain is then used in the fairways and foregreens in the autumn around the middle of September, when we go down to the interface between root zone and sub grade, which is about 15cm below the surface.

Fertiliser applications are split between using granular products and foliar products. We use a slow release product, 28-3-10 sulphur-coated toward the end of May, with a second 15-0-0 in July, finishing with a 10-5-25 50% slow release in the beginning of September.

The total amount of nitrogen applied in the season is 2.5 lbs of N per 1000ft2. (1.2 Kilo N per 100 sq. metres) this includes the foliar applications of iron sulphate and micronutrients at very low rates spaced 28 days apart.

We use no plant protectants on the fairways and see very little disease activity, other than an occasional spot of red thread.

The fairways are maintained at 15mm and are mown three times a week with two Jacobsen LF128 4WD units returning clippings. Irrigation is kept to a minimum to promote firm fairways and discourage moss, algae, disease and Poa annua. In respect to weed management we have moved away from blanket spraying and now spot spray when needed.

Drainage issues are addressed as they occur and due to the extensive drain system installed during construction we don't have to trench too far before being able to tie into and existing run. All additions are added to the drainage maps supplied by the building contractor, continually updating for future reference.

Tees

In the spring we hollow tine the tees using 5/8" tines removing the cores. At this time we also topdress and overseed the tees still using the original blend. This all takes place about two weeks prior to opening. Germination is observed and new seedlings start to fill in voids from left over damage from the previous autumn. Each month from May to August we hollow tine, overseed and topdress the tees. Each Monday, despite two sand boxes being present on each tee, we fill all divots by hand and use a lute to smooth out the damaged areas. The combination of divot filling, aerifying, dressing, and overseeding have preserved conditions, maintaining turf cover and level tee boxes.

Fertility is geared towards promoting strong growth and recovery. The total amount of nitrogen applied to tees between April and October is 3.5lbs of N per 1000 sq. feet. (1.75 kilo N per 100 sq. meters) which includes the foliar applications of iron sulphate, chelated nutrients, and kelp derived products. Low rates at frequent intervals and the use of iron sulphate maintains steady growth, eliminating surges in growth and unnatural flushes of colour while supplying the plant with sufficient nutrients to grow, recover, and resist attack from disease.

Like fairways no plant protectants are used and back pack spot spraying for weeds has only been necessary one time in three years. The tees are monitored closely for irrigation purposes maintaining sufficient moisture in the soil profile to maintain and encourage germination and divot repair. The sprinkler heads all have adjustable arcs and surrounds receive almost no water as the heads are adjusted to cover the teeing surface only. Tee surrounds are cut with a push type rotary for about one metre wide, with walkways mown out for player access.

Tees are hand mown with 26" Jacobsen 526 mowers at 10mm; all clippings are collected and distributed in the maintained rough in out of play areas. The size of the tees adds up to a total of 6500sq. meters and tee rotation is performed daily. The tees are split into left, middle and right zones and we work each zone on a weekly rotation. This gives each area a clear two-week rest time, at minimum, allowing for recovery from both foot traffic and divots. Verticutting is performed each month during the growing season to remove thatch, horizontally growing shoots and helping with the control weed development.

Greens

Starting with hollow tining in the spring using 5/8" hollow tines the aerification program for greens is quite intense. The aerification programme this last year is outlined below:

April
Hollow Tined using 5/8" hollow tines to a depth of 7.5cm on a 2x2 spacing
May
Hollow Tined using mini tines to depth of 6cm on a 2x2 spacing
June
Solid Tined using 3/8" solid tines to a depth of 7.5cm on a 2x2 spacing
July
Solid Tined using mini tines to depth of 6cm on a 2x2 spacing
August
Hollow Tined using 5/8" hollow tines to a depth of 7.5cm on a 2x2 spacing
September
Solid Tined using mini tines to a depth of 6cm on a 2x2 spacing

Fertility applications with granular and foliar products between April and November sees a total application of nitrogen of 4.75lbs N per 1000 sq. feet (2.3 kilo N per 100 sq. meters) No herbicides have been used on greens to this date. Some Take all Patch was observed the first year and its development was held in check by using acidifying fertiliser and iron sulphate. We used an Andersons 13-2-13 ammonium sulphate on a three weekly interval split with applications of iron sulphate.

Greens are hand mown six days a week at 3.5mm, there are no weeds, no moss and if you find a poa annua plant you might be considered lucky! Each operator spends 10 minutes before mowing the green fixing ball marks, and handpicking any poa annua trying to establish itself. From the first day we trained all the staff to identify that wonderful little plant even at 3.5mm and we haven't budged from the programme. They mow the same greens each time and know every bump and dip. Pride plays a huge part in the success of adopting this type of practice and competition to have the best set of greens is as strong as I have ever seen in a greens staff. The five staff members who mow greens walk every step of the way, it takes them three hours to mow four greens each, return to the barn, wash up and be ready for the next task.

All have been trained to observe and report on anything amiss, from a

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bunker not being raked, identifying a possible irrigation leak and specifically being aware of the quality of cut, not just with their machine but with those of others. Also I find the extra 20 minutes it takes to walk between four greens observing and enjoying the surroundings promotes a higher standard of employee and one who is more apt and able to report back to the senior staff.

Plant protectants were used in the first establishment year when Fusarium seemed to be enjoying the presence of all those young seedling plants. The last two years though I have made a total of four applications of Iprodione one each Spring and one each autumn as preventative applications.

The greens are verticut every three weeks after which they are topdressed and brushed. Several greens have severe slopes and scalping was a huge problem when we started to drop the cutting height. To solve this problem we hand dressed the slopes each week and used the lute to work in the dressing. This had the effect over one summer of softening the severity of the slopes and the areas of scalping slowly shrank in size and are now almost undetectable. The walk mowers are fitted with groomers, however, I have no hard and fast rule about using them. Visual quality more than anything dictates their usage, horizontal growth and perhaps tournament preparation may see more frequent use if green speed becomes an issue.

Flags are moved and we have three sets of aluminium cups that are rotated around, sanded and repainted before being used again. Each day the cup is wiped clean preventing the build up of algae and dirt within the cup. We also use a three-colour flag system to indicate the location of the hole on the green. Red flags indicate the front third of the green, yellow the middle third and white the back..

The greens are monitored closely for irrigation purposes and are typically allowed to dry considerably between deep watering. It often rains before the need for irrigation occurs, with May and August being the two months that I can truly control soil moisture. I have spent numerous hours defending keeping the greens firm and dry and I know I am not alone on this subject.

Staffing at Meland

Full time staff at Meland consists of the Golf Course Superintendent, Assistant Superintendent, the Equipment Technician and two Greenkeepers.

During the golfing season we bring on additional help starting in April with the addition of one seasonal employee and two Student interns, one from England and one from the United States. In the middle of June the main influx of summer help begin bringing staffing up to 12 for the months of June, July and August. Last year we had 16 people on the payroll but at any one time we only had 12 reporting for work. The scheduling of staff is a task in itself as everyone takes at least one-week vacation, even the seasonal people.

Since writing this piece Kirsten has moved from Norway to take up a position as Centre Director for Open Golf Centres in Bournemouth

Above top: 8th tee, fairway and green, Feb 1998

Above middle: Same hole, June 1998

Above bottom: Completed 8th hole, May 2000

Far left: Double cutting the 5th green, May 2000