



## **Tattersall's Park Track Report for the Australian Trainers' Association and Tasmanian Jockeys' Association**

### **Current status**

The Course Proper was constructed in 1997 using a type of sand that was considered at that time by the industry to be acceptable. The thinking at the time was to include a percentage of silt and clay to provide some soil strength. While this addition of silt and clay did provide soil strength, it also caused compaction. Soil tests show that the sand used for construction of the Course Proper has as much as 20% silt and clay.

Root zone specification for all sports surfaces constantly change with new technology and research.

Track design has changed since 1997. Modern track construction uses sand that drains much faster, the drainage rate is called "Infiltration". Tracks should have an infiltration rate of at least 150mm per hour after compaction. This is achieved by not having more than 5% silt plus clay. (Mowbray has an infiltration of 400mm per hour). This ensures that tracks do not have major variations from heavy to fast through the seasons or after heavy rain. Sand based tracks also have less MSI type injuries.

Tracks that get wet and heavy through the winter will usually get very hard in summer. The Course Proper and the Inside Track both suffer from this problem.

The problems associated with older type track design specifications are mainly compaction and its effect.

Compaction is when all the individual particles of the soil are squeezed together so tightly that water and air cannot pass through it easily, silt and clay particles are extremely fine and effectively plug all the gaps.

This causes water to lie on top of the soil without draining away and effects root growth by preventing Gaseous Exchange. Plant Roots need to get rid of Carbon Dioxide and breathe Oxygen or else they will die. This is the single most common problem facing Track Managers all over the world not just in our state.

We have measured the infiltration rate of the Course Proper at the end of last winter and found that the track had no ability to drain. The infiltration tests measured zero in most cases. It must be remembered that Tasmania has had the wettest winter in 70 years.

There has been a plethora of miss-information surrounding this track, most of the claims regarding the poor drainage or lack thereof are due to compaction and not the lack of drains under the track. In fact, the profile or cross section of the track is uniform.

Another problem that exists on both tracks and also contributes to poor drainage is thatch and mat. Thatch is un-decomposed organic matter. Mat is decomposed organic matter. These exist in layers and it is normal and desirable to have some amount. In our case we have far too much. Mat actually resembles mud when it is constantly churned up and ground down by the action of horse racing. Even modern tracks can become poorly drained by having a mat layer that is too thick as it is capable of sealing over even the fastest draining tracks.

### **Current solutions**

The physical problems with the track were investigated and relevant testing was conducted by NATA recognized Soil Laboratories. As mentioned above, the problems with our tracks are Compaction, Thatch and Mat. The soil tests show just how quickly the soil can be compacted in a Laboratory. On the track the situation is much worse, the weight of a horse in full gallop with only one hoof on the ground is measured in tons.

A range of equipment was purchased to address each individual problem, also a change to maintenance practices were implemented to gain a steady improvement in quality and performance of the tracks. Improvement is not fast and can take a number of seasons. The maintenance practices in the past were not wrong but not intensive enough to maintain adequate infiltration.

### **Improving infiltration**

Horse racing has been identified as the most damaging end use for turfgrass. Whilst the actual tearing and displacing of turf is severe, it is compaction that causes most of the problems faced on a racetrack. Compaction causes the turf to decline and prevents recovery, it also interferes with infiltration causing poor drainage. Poor drainage leads to race cancellations or at best inconsistent weather effected tracks.

In order to successfully relieve compaction at Tattersall's Park, we have to look at all methods to increase or restore infiltration to acceptable levels. A new track will have an infiltration of at least 150mm per hour in a heavily compacted state. Our tracks have improved, although some areas still drain very poorly, some areas such as the back straight on both tracks measure zero.

Listed is a brief review of some of the new machines we are using to gain this improvement. All these machines are used at the well known big tracks in New South Wales and Victoria.

Both Racing NSW and RVL have a fleet of these machines for the less financial clubs to use. All the machines have been around for over ten years except the sand slitting machine which is very new.

The machines that specifically relieve compaction are as follows:

### **Verti-drain**

This machine drives 300mm tines into the track at 100mm centre's the machine can be set to heave the ground upwards or to enter and exit vertically with no heave. The action of a Verti-drain is likened to driving a garden fork into the soil and bending it backwards to lift the soil slightly. The holes that remain provide vertical drainage channels for water to drain through. This machine is effective and can be used at varying depths. It takes approximately 2-3 days to Verti-drain the track.

We currently use this machine on at least a monthly basis. We will use this machine after every race meeting during winter weather permitting. This effectively relieves compaction after every race. Due to its weight that bears on a roller, it replaces the old practice of rolling tracks with a heavy roller.

This machine is very effective at removing fast lanes caused by compaction.

### **Agri-vator - or the big brother of an Aerovator**

This machine is a modified spiker. The spikes are 150mm long and can be agitated to loosen the track to a depth of between 25 to 150mm, this machine was used successfully through the summer to soften the hard tracks.

This machine is used as required, it is very useful to work topdressing into the holes it creates. This ensures sheer-plane does not occur. Sheer plane is caused when two different layers of soils meet.

We have had some problems with this machine as it is capable of finding hidden sheer-planes or layers that separate easily. This does appear as a shifting surface however the same type of machine is used to prevent slipping during race meetings in Victoria.

### **Rotary De-compactor (Earthquake)**

This machine has large knives that slice the track down to a depth of 350mm. There are eight knives spaced at 275mm, they cut a slot 20mm wide. The action causes the soil to move sideways and back again effectively shattering the soil and relieving compaction.

These machines are considered to be revolutionary especially where heavy compaction takes place. The decompaction increases infiltration with regular use. There is no other machine currently available that can achieve this depth. It has an attachment that can install sand into the slots cut by the machine. This machine was chosen over all other comparative machines for the depth. The knives will touch the top of the drainage gravel surrounding the drains below and leave drainage slots. This machine arrived in late February and we intend to use it every 3-4 months.

### **Roto-Drain (sand slitter)**

This is an attachment that fits onto the back of the Rotary De-compactor, it has a series of hollow coulters that inject sand into the slots cut by the rotary de-compactor. The process is called sand slitting, this is widely used to improve drainage.

We have installed sand slits to the back straight of the Inside Track, there was a noticeable improvement in 5 days even though the machine did not work to its full potential.

This machine works best with dry flowing sand. The sand stockpiled for topdressing and sand-slitting was too moist to flow freely. This sand will be used only for topdressing.

As we intend to use this on a regular basis, the machine had to be modified to use any sand we choose at any time of the year. This was simple but took some trial and error to get the machine to deposit sand evenly down the slots. The cost of modifications still make this machine \$10,000 cheaper than comparative American Machines.

The machine is capable of putting sand down to around 300 mm. We have not been able to achieve this yet as it has caused considerable damage in the trial work that we did prior to putting the machine on the track. If the area underneath the track is dry it tends to slide the turf forward. It is not a risk we are prepared to take if we want to race on this track in a timely manner.

This machine is very slow and we still need to perfect the way we use it. By the time we finish the back straight we will know a lot more.

### **Cultural Practices that improve drainage, consistency and manage Thatch and Mat**

#### **Fertilization**

Fertilizing infrequently using Granular products cause a flush of growth that deposits thatch and mat in large quantities. This is due to a months worth of nutrients being applied and becoming available to the plant within a week of application.

Granular fertilizers need to be washed in with 10mm of irrigation which is impossible as the weather gets colder as it will slow the tracks down too much.

All nutrients are better applied in small frequent quantities.

We are using soluble fertilizers that are sprayed on each week to provide an even growth pattern. This effectively limits the amount of thatch and mat that can occur.

The leaves of the grass can take up as much as 70% of the fertilizer, the rest is taken up by the roots.

This is important when you consider the damaged roots following a race meeting cannot take up nutrients in the required quantities to maximize recovery.

We have had good results so far with this method of fertilizing with a reduction of about 40% of fertilizer applied. Through winter we will use a mix of granular and foliar applied fertilizer.

A foliar applied fertilizer program has been designed by an independent agronomist, it takes time to provide the correct ratios of nutrients and how they react with each other.

In order to manage this we take leaf tissue tests every month to modify the program as required.

### **Irrigation**

Irrigation is the biggest input required in track maintenance.

Irrigation practices have been changed to water the tracks with higher amounts on an infrequent or as required basis.

Shallow frequent irrigation is another major contributor to thatch and mat. Shallow irrigation causes shallow roots, weed grasses such as Winter Grass and surface compaction.

The practice of applying irrigation in small amounts to soften areas is actually causing a bigger problem in the long run by perpetuating the inconsistency of the track.

Most of the irrigation has been performed with a tow boom arrangement, this is actually an even way of irrigating. The big disadvantage is the time it takes.

To irrigate a track with 15mm takes around 8 to 10 hours.

We are looking to upgrade our controller so that the in-ground system can be used automatically.

We are currently experiencing a difficult issue on the Course Proper. The outside and other isolated areas are dry and suffering drought stress while other areas are almost water-logged.

We cannot apply irrigation to these dry areas without causing major problems to the wetter areas.

The sand slitting machine and tractor weigh nearly 10 tons. The machinery and tractor to supply sand into the sand slitter weighs almost the same when full of sand. There will be dry areas around the track until we have finished the sand slitting.

## **Topdressing**

The Course Proper has been topdressed with sand prior to the Tasmanian Summer Racing Carnival. Topdressing is required to provide a good seed bed when over sowing. One of the greatest benefits of topdressing with sand is to provide a cushion layer on hard tracks. Topdressing does improve inconsistent tracks by providing a consistent cushion layer of sand that helps to reduce harder compacted sections of track.

Topdressing sand sits over or fills the holes and slits made by machinery that decompact the track, this effectively keeps the surface from sealing over and maintains infiltration. It is essential that topdressing is keyed into the existing surface so that a sheer plane does not occur. This is achieved by coring or spiking the surface prior to or after the application of topdressing so that some sand migrates into the holes.

When topdressing is mixed up with the mat layer it reduces the mud effect, this allows for additional passes to be made with the Super Sopper to mop up standing water. If the track is muddy only one pass can be made with this machine.

## **Grass type**

The grass on a track is only there to provide sheer strength and keep the track together. It is the only known product that can self repair. It was thought to provide a good cushion for horses although recent research suggests that cushion comes from the sand or soil used in the tracks construction.

Unfortunately, it is difficult to establish Kikuyu in Tasmania, we therefore have to rely on cool season grasses such as Rye and Kentucky Bluegrass. These grasses are much weaker than any of the warm season grasses like Kikuyu or couch.

We have over sown the Course Proper with 2 different creeping grasses. One is impact ryegrass and the other is Kentucky bluegrass. These grasses when damaged initiate stolons or runners that grow into the divots from the edge and base of the divot aiding recovery. The benefits of these grasses have not been fully realized as they are still immature. After sand slitting we will over-sow using a fast germinating annual ryegrass for winter durability.

## **Renovations**

The Course Proper has been renovated twice, once after winter and once after the Hobart Cup. Renovations are the best time to deep and shallow core to remove thatch and mat, renovating the track often reduces hardness. Over \$80,000 has been spent on sand and seed. We have also been able to reduce the winter-grass population and introduce ryegrass into the large colonized areas of winter grass. This will allow us to slowly kill the remaining winter-grass without having any bare areas. The winter-grass on the home turn can turn dangerous. Renovations in future should take less time as re-seeding should not be required on a broad acre basis. Whilst it would be ideal to spell tracks for long periods, it is becoming more difficult due to race programs. It is better to perform little and often type renovations to fit between races.

## **Track fill**

Both tracks used to be filled with sand that had similar clay content to the tracks. This track fill contributes to poor drainage, slow recovery and compaction.

The typical condition of a track that has just been raced on has a percentage of divots that have been completely chopped out, a percentage that are lifted but with some part still anchored in place and a percentage that are deep depressions where the turf has been compressed, damaged but with the ability to recover.

If a sand containing clay is used it compacts very quickly, while this provides a level surface it effectively prevents any growth to come from the base and sides of the divot and will seal the surface.

We are now using a fine sand with no clay or silt, this sand has a high infiltration rate. It is noticeable that track recovery is faster using this sand.

There were other darker sands available. But this one was initially chosen for its absence of larger particles that could flick up and cause problems.

One of our leading Jockey's is concerned that this sand causes the track to be inconsistent by being softer in areas with more divots. I am not sure that this is happening, however, we will look for alternative track fill sand that provides a firmer footing without compromising drainage.

## **Rail Shifts**

Rail shifts became a contentious issue during the last race meeting. Tasracing management was contacted by a trainer and a jockey and suggested that the rail should be shifted as the rail was "off".

At that time a pit lid had collapsed on the Inside Track and another riser had been uncovered. An old plan clearly showed two marked pits and not a riser. Management had contacted all underground asset companies to send a remote camera into the pipe work to see what other pipes or pits could be in the area. The only time this equipment was available was on Tuesday after the race meeting.

These pits were not known to exist prior to this.

In conjunction with Stewards, we could not allow any racing on the Inside Track until all avenues were exhausted to find the pits.

What this meant was that at the time we did not know when racing could resume on the Inside Track.

As only 54 horses had raced the 2 weeks prior and the fact that trials were to be held on Monday, it was better to preserve as much track as possible.

The track was filled and verti-drained to even out any inconsistencies, but the rail was not moved.

As it turned out no other Pits were found, we did not receive any rain, the track did suffer a bit, but we could have moved the rail. It could have easily gone the other way.

The point is that we have at least 8 race meetings to get through until winter is past. Moving the rail in increments is the only way we can manage wear.

After the sand slitting, we hope to move back into the true position and may move the rail up to 3 positions in the back straight before we get back into true. We may have to race a meeting on the Inside Track as well to get through. This will effect field sizes when the rail is out.

### **Track preparation policy**

In order to identify issues with any track leading up to a race meeting, a new policy and procedure has been implemented.

The policy requires a written description of track conditions on 3 separate occasions prior to the race meeting. The first sheet is required to be filled out no later than 5 days prior to a race meeting.

The second sheet is required to be filled out the day prior and the third on the day of the race meeting.

The aim of the documentation is to provide the earliest possible warning to any issues so that a different venue can be organized in the event of a possible re-schedule or at least an inspection of the track with senior Jockeys and Stewards.

This policy has worked well so far, the Jockeys and Stewards have inspected the Inside Track at least three times in the past month to gauge the safety of the track well prior to racing.

I have inspected each track with the managers prior to all race meetings to ensure that the recording of information is accurate.

### **Moving Forward**

The sand slitting is in progress on the back straight and will continue through this week and next week. There is an undetermined recovery time at present.

Two senior Jockeys and the Chief Steward will be consulted in regard to when we can return to the Course Proper, it may be that the next two race meetings will be held on the Inside Track to ensure recovery.

The Inside Track has recovered well and could have easily been raced on in two weeks after the work was performed. With the temperature dropping this may not be the case with the Course Proper.

We may have to look at some options with trials, I am not sure at how we can satisfy all trainers and would like some input into where we go through winter.

Neil Gardner  
**Asset Manager, Tracks and Facilities**