Cricket Pitch Maintenance

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Chapter 1

Cricket Pitch Maintenance: An Introduction

Introduction

Cricket is typically played on a grass pitch (often a rectangular shape) and will have a various number of pitch positions. The length of an adult pitch is 20.12m (22 yards), whilst a 'typical' pitch might be 24m (length) x 30m (width).

The playing season can generally be from the middle of April to September, depending upon which league it is.

Quality

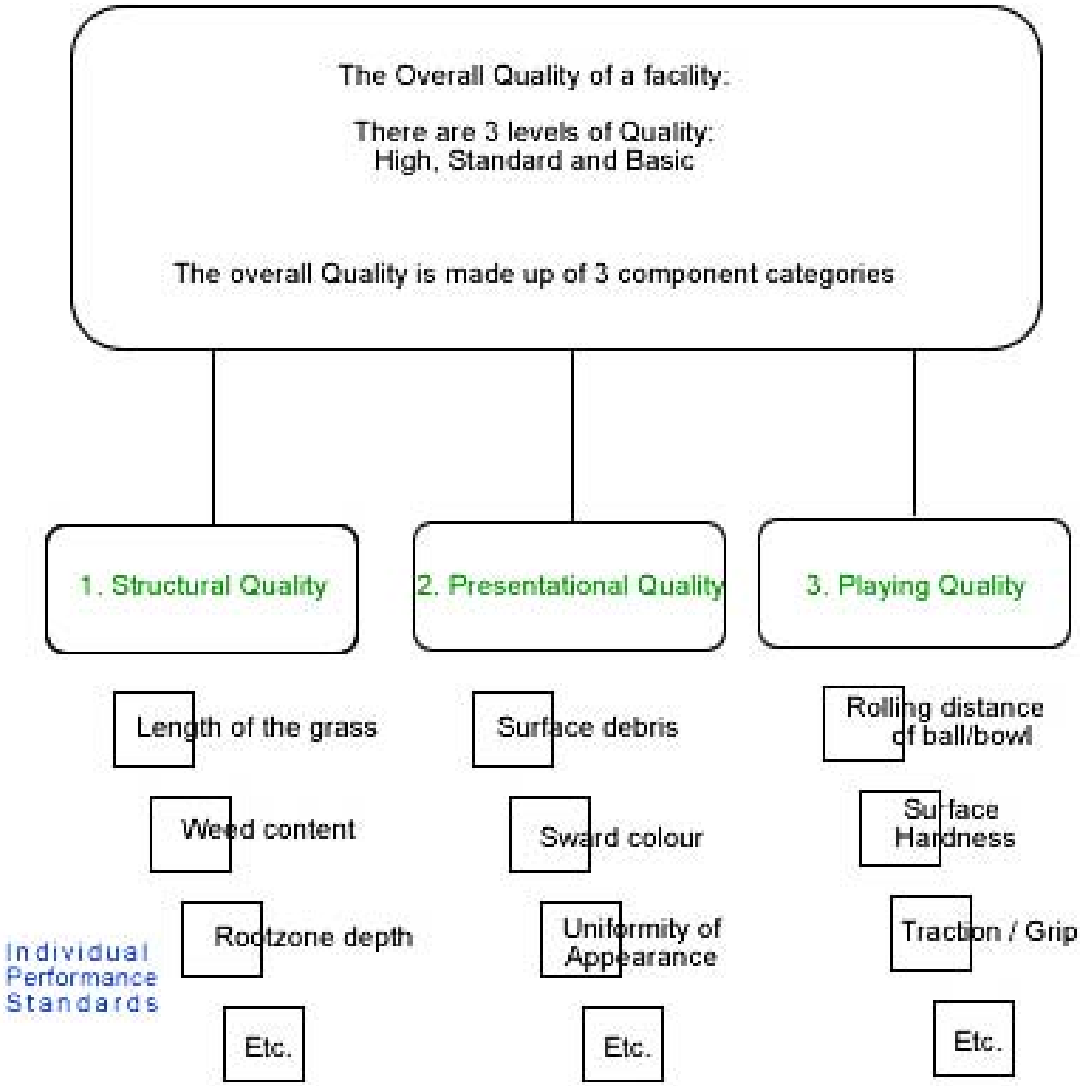
A cricket pitch should ideally be

- even throughout, with no undulations or depressions;
- well consolidated, giving good and appropriate ball bounce;
- covered with a dense sward of desirable grasses that have good root density and depth;

In addition, a well-prepared pitch should ideally be able to withstand the equivalent of three, five-hour games.

To ensure that a cricket pitch is maintained correctly, not only during the playing season but also throughout the whole of the year, a number of individual performance standards are likely to be set. The combination of these standards determines the overall quality of the cricket pitch.

Diagram to Illustrate Quality and Individual Standards



The setting of these performance standards provides a means of objectively assessing the quality of the cricket pitch.

Most users wish to have a first class cricket pitch, however, the true cost in materials, machinery and especially the skills of a qualified and experienced groundsman do not come cheap. Realistically the aim is for a cricket pitch that plays well, is safe and is managed in a cost-effective manner.

The actual maintenance cost for a cricket pitch will depend on a number of variables, in particular what is actually included within the so called true cost as some costs are hidden within other charges, especially when comparing local authority costs. A like for like comparison can be notoriously difficult to achieve.

Chapter 2

Pre-Season Maintenance

Introduction

The work carried out during this period will cover January to April and play will typically commence during the latter part of April or early May depending upon the level of competition.

Adequate pre-season work is essential if a well-prepared pitch is to be presented for play during the summer months.

When soil conditions are wet during the pre-season period then it is beneficial to keep off the pitch as much as possible.

All groundstaff need to know about their particular pitch and what is expected from it. The importance of understanding management and maintenance requirements of different pitch constructions cannot be emphasised enough. This is an essential prerequisite for good turf management techniques and should be the foundation on which a yearly maintenance programme is based.

Rolling

The most significant and difficult part of pre-season cricket maintenance is rolling. This is usually a blend of art, science and local knowledge. There is no hard and fast rule about how often and how heavy a roller should be to prepare a pitch for the season, however, useful guidelines can be given.

- When to start rolling will depend upon local soil and weather conditions. An initial light rolling might commence in February (with a 3 cwt light roller), with the weight increasing quite significantly during March. Towards the end of March the weight of the roller could be 1 to 1.5 tonnes.
- Initial light rolling can help to settle any frost heave that may have occurred over the winter period.
- The ground should be moist but not wet when rolling takes place.
- Rolling frequency and weight of roller used will gradually increase as the playing season approaches.
- After rolling, it is usually a good idea to lightly spike with a sarel spiked roller, or similar, to a depth of 25 to 40mm.
- If staffing levels permit then rolling might be carried out on a daily basis for up to a month prior to the middle to end of April. The main aim is to consolidate the soil in the pitch down to about 150mm depth (at least 100mm), before the first match takes place.

Mowing

Gradually reduce the height of cut from the winter height of 12-25mm (this will depend upon the requirements of the dominant grass species and standard required) to the start of the season height of say 10-18mm.

It is important to reduce the height slowly over the whole of this period otherwise a rapid reduction can lead to a drastic thinning of the sward. This will be particularly evident if a late frost, cold wet spells or cold winds occur.

Always box off the clippings to reduce the chance of disease attacks and earthworm activity.

Chemical applications

The need to spray will depend on weather conditions and the condition of the pitch. Fusarium might be a problem following any early fertiliser application that might take place in March, whilst earthworm activity can be a problem as the winter frosts recede and the spring approaches.

Scarification

At this early stage of the year it is best to lightly scarify during mild periods. Take care not to scarify too severely as the grass will struggle to maintain a suitable surface. It is particularly important that a well-developed root system is produced on a pitch, otherwise the soil will crumble during the playing season. Severe scarification can result in increased leaf growth at the expense of root growth. Take a balanced approach and be sensible about severity of any operations undertaken.

Dragbrushing

Carry this operation out on a regular basis to keep the grass upright, which will help to keep adequate airflow around the grass blades. Earthworm casts, if present, will be dispersed on a regular basis and this will help to prevent the grass from becoming smothered. A consequence of leaving undisturbed earthworm casts on the pitch is that besides the underlying grass will die out and weeds will be able to invade the weakened areas.

Fertiliser application

A light application of a fertiliser during the middle of March may be considered. A typical application might provide 2 g/N/m² (As an example, this could be given as 25 g/m² of an 8:0:0 fertiliser). A small of amount of iron within the fertiliser may also be considered.

Chapter 3

Playing Season Maintenance

Introduction

This section has been divided into the general tasks that are carried out in the maintenance of a cricket pitch, the task of pitch preparation and post-match renovation.

Throughout the season it is quite probable that a number of complaints will be received about a pitch or pitches. Sometimes this will be unjustified and can be put down to poor losers. At other times, the complaints may have some substance to them and these will need looking into.

Common complaints might include inadequate bounce or the ball deviating unintentionally from the desired line.

Rolling

A very interesting article on rolling appeared in the June 2001 issue of *'The Groundsman'*, *('Get back to basics to get rolling results just right' by Alex Vickers, pp16-17)* which identifies how rolling increases soil strength in two ways:

- Sand dominated soils - "..strength is increased by packing soil particles closer together. This increases friction between particles, locking them together..."
- Clay dominated soils - "..rolling increases the number of small pores in the soil. These pores strongly hold onto water and it is this internal cohesion that provides the extra strength in a rolled clay soil when it dries".

A cricket pitch exhibits a combination of these effects due to a heavy clay loam being a mixture of clay, sand and silt.

One common tip for rolling is that if the surface of the pitch starts to turn blackish, then stop rolling and wait an hour or so before recommencing.

During April the weight of the roller used will typically be 1½ - 2 tonnes.

Take care not to use a heavy roller on a dry surface of a pitch otherwise the soil may crumble, especially if grass root density and depth is not ideal.

Mowing

The frequency of mowing will depend upon the amount of top growth produced and the standard of pitch required. Typically a pitch will be mown twice a week, however, mowing three or four times per week may also be needed.

The height of cut will generally be 8 to 12mm for the pitch, however, when a pitch is starting to be prepared this will gradually be reduced to 2-5mm (1/16" - 3/16") on the day of play, depending upon requirements and the smoothness of the surface.

Scarification

Thatch and fibre can be a major problem in cricket squares and these can be a significant cause of surface faults, which results in absorbing energy from a cricket ball consequently reducing ball bounce and also slowing of the speed of the ball during delivery.

Unpredictable deliveries can also result from thatch and fibre, making for a potentially dangerous pitch.

Regular scarification should be carried out in addition to that, which is undertaken in the preparation of a pitch.

Fertiliser application

Adequate nutrients will need to be applied during the growing season to ensure a hardwearing sward is maintained. A range of fertilisers is suitable for use on a cricket pitch and the following typical fertiliser requirements could be used as a starting point: *(Reference, STRI 'Fertilisers for Turf, 1996, p.36)*

- Nitrogen: 8 -12 g/m²;
- Phosphate: 2 - 4 g/m²;
- Potash: 4 - 10 g/m².

The quantity of phosphate and potash will depend upon soil analyses and sward assessments; however, an application of phosphate can be beneficial during renovation time to aid seedling establishment.

A general programme along the following lines could be used as a guide; however, each pitch will have different requirements:

- April: 14:0:7 @ 35g/m², providing 4.9 g/N/m²,
- May/June: 8:0:0 @ 35g/m², providing 2.8 g/N/m²,
- August: 11:5:5 @ 25g/m², providing 2.75 g/N/m².

Drag-brushing

This should be carried out on a regular, almost daily, basis.

Chemical Applications

May is usually a good time to carry out any herbicide application. Growth is usually good at this time of year and this allows for an effective elimination of most weeds.

Fusarium patch might be a problem on intensively maintained cricket squares, however, with perennial

ryegrass dominated squares this should not be as much of a consideration as for example on golf or bowling greens.

Careful observation will be required though, so don't neglect this task.

Irrigation

Irrigation will be required throughout the season to maintain not only a good surface but to allow the soil particles to be squeezed together during the process of rolling. Rolling a dry soil will result in it cracking, producing an unacceptable playing surface.

The use of rotary type sprinklers can result in uneven coverage. This in turn can produce an uneven ball bounce. It is important to irrigate to a suitable depth, to at least 75mm, and not just to penetrate the immediate surface of the soil.

Pitch preparation

To prepare a pitch ready for a match a certain number of days will be required to get the pitch into a suitable condition. The time taken will depend upon the standard of play as well as how well the pre-season work had been carried out.

Pitch preparation can generally take anything from 5 to 10 days, occasionally up to 14 days: There are no hard and fast rules, however, the following will serve as a useful guide:

A 'typical' pitch preparation programme for a 7-day period:

Day 1: Roll (1-2 hours), Mow, Scarify, Irrigate;

Day 2: Drag-brush, Scarify, Mow;

Day 3: Roll (½-1½ hours), Drag-brush;

Day 4: Drag-brush, Scarify, Mow; (This is also the last time to safely irrigate the pitch before the match day)

Day 5: Roll (½-1 hour), Drag-brush; Mow;

Day 6: Roll (½-1 hour), Drag-brush, Scarify, Mow, Mark-out (or on match day);

Day 7: Match Day: Drag-brush, Scarify, Double mow (1/16"-2/16"), Final Roll of 10 minutes, Mark-out.

Post-match renovation

Immediately after the match has finished brush, using a besom broom, the ends of the pitches. Tidy up the pitch by giving it a cut to remove any surface vegetative debris.

Repair any damaged footholds by firming with a heavy clay loam.

Irrigate the pitch to help subsequent sarel spiking and overseed thin and bare areas. The use of pre-germinated seeds, especially on the pitch ends should be considered.

Apply a fertiliser (possibly a liquid one) to the whole of the pitch to help for a quick rejuvenation. A typical one will contain 8-14% nitrogen and applied at 25-35 g/m².

Cover some of the thin areas and pitch ends with fine grass clippings. This will help to act as a fine mulch and aid seed establishment.

If the pitch is to be used later in the season, then do not top-dress the pitch for now. Following a good renovation within the season then it could be used again within some six weeks.

It is good practice to renovate pitches as they come out of use for the season.

Other

This might include pest control, however, this is generally not so much of a problem on cricket squares during the summer period.

Chapter 4

End of Season Maintenance

Introduction

This involves renovating the pitch to help it to recover from the ravages of the season. If pitches have been gradually renovated as they come out of use, then this final task will be that much easier to complete.

Aeration

A good opening up of the pitch should be carried out. The type of aeration that is required will vary depending upon local conditions. Typically this will be with solid tines, however, the use of hollow-tines or deep spiking with solid tines may also be considered.

To help alleviate the intentional compaction produced during the playing season, it is important to aerate to a suitable depth. Typically this will be to 125mm or so.

Prior to aeration it is desirable to soak the pitch to allow for easier and improved tine penetration.

Scarification

The pitch should be given a thorough scarification to remove any surface thatch. This can be a cause of poor playing conditions as noted in the previous section on scarification. Scouring of the surface will also produce grooves into which grass seed will be able to settle and establish.

Overseeding

Use an appropriate grass seed mixture. This might be a blend of several perennial ryegrass cultivars as the only application or it may include Chewing's fescues and browntop bents for oversowing within the main body of the pitch.

To ensure evenness of application, spread the seed in several directions. In addition, it can sometimes be beneficial to 'drill' seed into the surface by using a seed-drill machine such as the SISIS autoseeder, or similar machine.

It is a good idea to give consideration to purchasing a good quality grass seed. Besides being provided with a good cultivar, the purity of the seed will be excellent and will contain less weed seeds than lesser quality products. A benefit of this is that there can be a reduced need to apply herbicides, save on application costs and will be more environmentally friendly.

Fertiliser application

An end of season fertiliser might typically be given towards the end of August. It would be low in nitrogen and an appropriate amount of phosphate would be included to aid seed establishment.

Top-dressing

It is important to ensure that not only is an appropriate material used with the required soil strength for the standard of pitch, but the material must also be compatible with the existing soil profile. Problems of using incompatible material and resulting layering are well documented and this results in low and uneven bounce.

It is good practice to make sure the top-dressing material is tested beforehand to confirm soil strength and compatibility. The binding strength of soil, measured using the ASSB method, can be suitably determined by a groundsman using his or her own basic equipment.

General figures for club level pitches are 45 kg (minimum), whilst for first class pitches this will be 55 kg (minimum).

The percentage of clay within a top-dressing for a club level pitch will be within the range 24-30%, whilst that of a first class pitch will be 28-36%.

To achieve a very evenly spread and worked in top-dressing, the use of strings at 1m spacings, stretching the length of the pitch (22m+) can be considered, although this can be more time consuming than other methods of applying top-dressing. However, if evenness of application is to be achieved then this method may be more appropriate. (6)

A typical rate of application for a top-dressing is 2 - 3 kg/m².

Marl (a calcareous clay) is occasionally included as a mixture with a heavy clay loam dressing. A typical ratio is 70% clay loam: 30% marl. To prevent layering occurring it is essential to thoroughly incorporate the top-dressing into a spiked surface, ideally to at least 100mm depth.

Marl is not nowadays used on a regular basis as it has been shown to be difficult to manage correctly and produces distinct layers within a cricket soil profile.

Attention to saddles

With the continuous application of top-dressing material onto the pitch, it is almost inevitable that some degree of raised saddle will develop. To help reduce this effect some groundsman ensure that they apply top-dressing to the immediate surrounds of the pitch at the same time of the autumn renovation programme. This can help to reduce the effects of a saddle.

Two approaches to alleviating saddles can be considered:

Use a punch action hollow tine to remove soil and do not fill in the holes.

Strip turf from the ends, re-level and blend in with the surrounds. Returfing as necessary.

Other renovation work

If a pitch, or pitches, is found to be in need of more severe renovation work and other options have failed then it may need digging up and partially reconstructing. Whilst a full reconstruction to 12-14" depth may be considered too extravagant, excavating down to 150mm may be more appropriate and practical. New soil would be imported and reconsolidated in 50mm layers, with the finished level being some 25mm above the surrounding ground. This will allow for future sinkage and consolidation.

Such work would generally prevent the pitch/s from being used for a whole season.

The use of germination sheets can be of benefit, particularly on pitch ends. However, care needs to be taken as *Fusarium* can be encouraged due to the increased humidity and temperature that typically occurs beneath a germination sheet.

Turfing of pitch ends may sometimes be carried out. If this is to be undertaken properly it is essential that the turves have been grown on soil that is compatible with that of the existing cricket pitch.

'Typical' renovation programme

- Mow the grass short,
- Scarify in several (3 or 4, or more) directions,
- Aerate by appropriate means - this could be anything from deep solid spiking to sarel spiking to about 40mm depth, or even hollow-tining. It is important that the pitch is adequately moist to allow for good tine penetration when carrying out the aeration work,
- Overseed and drill the seed into the surface,
- Top-dress: Generally this might range from 1.5 to 3 kg/m², depending upon the type of aeration work carried out.
- Trulute or screed the top-dressing in,
- Irrigate to ensure adequate germination takes place,
- Ideally all this renovation will have been carried out by the middle of September. This should still allow for adequate germination and establishment before cold soil and air temperatures become unsuitable.

Post renovation work

Following renovation, the pitch will still need to be maintained and this will consist of the following:

- keeping the grass topped to around 25mm or as desired,
- regular drag-brushing,
- switching to remove dew,
- earthworm control,
- watching out for disease and controlling as necessary,
- aeration and
- maintaining the integrity of any fencing that may have been erected around the pitch.

Chapter 5

Non-Grass Wickets

It is usually a good idea to have an artificial wicket at the side of a pitch. This will be used for practice and warm-ups as well as when the main pitch is unsuitable for intensive use.

Regular maintenance of artificial wickets should, however, be undertaken to ensure they are kept in a suitable condition.

Different types of wickets and constructions can be encountered, although a soil or hard porous type base will probably be the commonest type of construction.

With a soil or hard porous base a wicket mat will typically be rolled up in spring and the surface layer will be raked all over, to a depth of 25mm or so, evened out and refirmed by rolling to produce a well consolidated base. The wicket will be relayed afterwards, with it being essential that the wicket mat is adequately tensioned prior to fixing into the ground to avoid wrinkles developing later on.

During the season the typical sort of work that will be carried out will consist of rolling of the wicket to keep the base firm, brushing to remove surface debris and ensure moss and weed growth does not build up on the mat and over-marking to maintain clear pitch markings.

Other work may include herbicide/moss application and a light top-dressing of sand and/or clay loam onto the wicket. A clay loam top-dressing, if applied, would typically only consist of a shovel full or so of material applied to the area of the wicket where the ball is pitched.

Repair of wickets may also be required. Patching to repair vandalised areas or excessively worn areas may need to be undertaken during the season.

Each wicket material may have there own special requirements, so always consult with the manufacturer recommendations beforehand.

Innovative ideas for broadening the potential of cricket squares have also been suggested by Peter Dury, *'Cricket pitches for the grass roots'*, *(Turf Management, July 1996, p.31)*, by using a combined hybrid of a synthetic and traditional construction. However, very little seems to have come of such ideas, with traditional squares and artificial wickets being the norm for facilities.

Chapter 6

Maintenance Calendar

The estimated number of occasions for which each task that is planned to be carried out can be presented in the form of a maintenance calendar.

The total number of actual operations will vary according to the prevailing weather conditions, as well as the geographic location of the cricket pitch; each factor can influence the length of the growing season and grass vigour.

Maintenance calendars can provide a very useful means for forward planning and the information can be converted into a staff profile, indicating workload levels, material requirements or budget flow.

The 'Months' in the Table are given as 4 or 5 week periods for convenience; this still adds up to 13 weeks per quarter. There is no reason why, for example, the January month is given as 5 weeks, so long as each quarterly block is made up of one 5 week period and the other two are 4 week periods, thus giving 13 weeks for each quarter.

It is useful to have April as a 5-week period as it gives some more leeway in planning, although this is probably arbitrary.

Each month could also be the exact number of days in a calendar month. Whichever system works for the user, then this is the one that should be adopted.

Table showing the estimated work required to achieve the desired standards

Task \ Month	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
(No.of weeks per 'month')	*5*	*4*	*4*	*5*	*4*	*4*	*5*	*4*	*4*	*5*	*4*	*4*	*52*
Mow @ 25mm (1")	1	1	4							5	2	1	14
Mow @ 10-12mm (2/5" - ½")				12	12	12	12	10	10				68
Aeration: Slit tine									2	1	1		4
Aeration: Solid tine			1	1					3				5
Aeration: 'Sarel' type tine				2	4	4	5	4	4				23
Aeration: Hollow tine of 'Saddles'									1				1
Initial squaring of the pitch			1										1
Top-dress									1				1
Overseed									1				1
Returf worn ends									1				1
Fertilise				1		1		1					3
Turf tonic - (Iron)			1										1
Light rolling (3-5 cwt): hours		1	2										3
Medium rolling (~10-15 cwt): hours			4										4
Heavy rolling (~1 - 1.5 tonne): hours			4	6									10
Scarification				2	1	1	1	1	3				9
Verticutting				1	2	2	2	2	1				10
Vertigroom			2	6	6	6	6	5	5				36

Dragbrushing	10	10	12	15	12	12	15	12	4	10	8	8	128
Irrigation				4	8	10	12	10	6				50
Pesticide application:													
Fungicide: Contact			1								1		2
Herbicide					1								1
Insecticide		1								1			2
Pitch Preparation				4	8	8	10	8	4				42
Pitch Renovation				4	8	8	10	8	4				42

Rolling of the pitch has been given as the general number of hours that might typically be spent during the pre-season period, however, this can vary significantly and it is not usually a good idea to state such figures because each cricket pitch will vary in its requirements.

The application of pesticides can vary depending upon the content of grasses present, as well as the quality of the maintenance practices carried out.

The amount of pitch preparation and pitch renovation will depend upon the number of games being programmed. For this exercise let us assume that the playing season is 21 weeks (3rd week in April to 2nd week in September) in length and there are an expected 2 games per week. The actual number will vary slightly, but as a planning exercise this will be a good start.

Operations such as switching, systemic fungicide application, moss application, the erection and dismantling of perimeter fencing may also be included within the maintenance calendar.

Some operations, such as scarification may not be carried out over the whole pitch during the playing season with it being restricted to when each pitch is being prepared.

Verticutting might not be undertaken at all, whilst verti-grooming might be replaced by grooming with a comb attachment fitted behind the roller of a cylinder mower - it depends upon machinery resources.

Some groundstaff do not undertake slit tining during the autumn months, whilst others undertake it on several occasions - a lot of this is personal preference and adapting to local conditions.