

Supreme Sportsfields

for a Super City

2010 - 2050

100% PLAYABILITY

Technical Report on Auckland's Sports Fields
2009-2010

Report prepared by Cervadon Limited



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1.0 PURPOSE

The purpose of this Technical Report is to provide an overview of the best regional solutions for the Auckland Council to increase training and playing capacity to meet Auckland's growing demands for high quality, well performing sports fields.

1.1 Executive Summary

Warren and Leigh Hunt are Directors of Cervadon Ltd. Together they have over 50 years experience in the sports field industry, and are passionate about helping councils deliver the best amenity turf and sports fields to their communities.

The 2009-2010 Technical Report on Auckland's Sports Fields analyses the current state of Auckland sports fields and introduces a new benchmark in quality sports fields that Cervadon calls the *Supreme Sportsfield System*. We believe this is the best regional solution for Auckland Council including best practice in sports field management.

Historically, traditional sports field surfaces have been sown in Ryegrass, in soil fields throughout New Zealand. Since at least 2005, Ryegrass and Kikuyu, planted into soil or sand fields, have been actively promoted by some members of the industry as the best turf grass system. However, these grass varieties are resource hungry, consuming large quantities of potable water, fertilisers, fuel and labour. They invariably result in poor sports fields that are frequently closed particularly in winter. This acts as a barrier to the community being able to make sport an integral part of their lives.

When looking for a sustainable alternative to the use of inappropriate field types and grass varieties (particularly Ryegrass and Kikuyu), councils need to consider the environmental and social well being of their communities, in addition to achieving good financial results. This means councils taking a quadruple bottom line approach to ensure they adopt the best overall sports field system, which includes investing wisely in these sports fields throughout the life cycle of the asset.

Strategic decisions will need to be made about future capital expenditure in this area to ensure that the capital spend is targeted to the areas of highest demand or areas of greatest shortfall in supply.

Supreme Sportsfields are a cost effective solution for sports fields which also deliver strongly on environmental outcomes through, for example, reduced water use and less mowing, which contribute to a reduced carbon footprint.

Cervadon's ability to provide *Supreme Sportsfields* that perform exceptionally well and significantly reduce injuries and prevent field closures, enables the community to participate fully in physical activity which also contributes to positive social outcomes for Aucklanders.

With the use of *Supreme Sportsfields Systems* we can help Auckland Council achieve its aspiration of 100% playability on weekends.

2.0 KEY PERSONNEL

After obtaining his Masters degree in Agricultural Science at Massey University in 1969, Warren Hunt went on to earn his PhD in Plant Physiology at the University of California(Davis). In 2000, Warren established Cervadon with his son, Leigh, with the goal of commercialising a new variety of sports field grass (AgriDark) that he had developed during his 30 years as a DSIR and AgResearch scientist. Warren has responsibilities for propagation of AgriDark at Cervadon's nursery near Palmerston North, as well as performing Research and Development work on new promising sports grass varieties.



Leigh Hunt at AAMI Stadium in November, 2010

Our mission is to provide the best sports field grass, and best, most cost-effective sports fields that are good for people and the environment.

Leigh Hunt is responsible for marketing, distribution and consultancy services for Cervadon and *Supreme Sportsfield Systems*. He is the Secretary of the Sports Field Forum New Zealand whose members represent all facets of the turf industry from enthusiastic amateurs through to professional stadium managers. Leigh is also a founding member of the Turf Industry Collective of New Zealand which is comprised of representatives of key organisations within the turf and recreation industries. He is a member of the Turf Growers Association of Australia.

Leigh's experiences cross many turf industry sectors, includes council sports fields, golf, horse racing and stadiums. Leigh has been able to bring his broad and unique knowledge base together to help Cervadon develop new technologies in sports field maintenance and management, *Supreme Sportsfield Systems*.

"I am committed to finding better solutions for councils who are interested in delivering quality sports fields to their ratepayers. We take a quadruple-bottom-line approach to our work to ensure that we deliver positive social, environmental and economic outcomes. This requires us to balance the demands of the shareholder (council) with the needs of the stakeholders (sports clubs and the wider community), while considering best practice for the environment using *Supreme Sportsfield Systems*."

Leigh Hunt

Director
Cervadon Limited
Supreme Sportsfields and Parks Limited

3.0 Technical Report

3.1 A healthy and active Auckland engaged in sport

The Auckland Council has a portfolio of 224 sports parks, which contain around 700 sports fields. These parks are focussed on active recreation, and typically provide for related facilities such as sports fields, training lights, toilets and changing rooms, car parks and clubrooms. Organised sport is a well accepted and integral part of our society, and the council plays a key role in providing public facilities, particularly for outdoor sports. The council provides fields for use by a wide range of sports, including the primary codes (football, rugby, league, cricket and softball), and a range of other sports codes (including touch, tag, kilikiti, athletics, lacrosse, summer football). For the summer and winter sports seasons, the council allocates fields to each sports code for competition use on the weekends. Sports clubs typically book seasonal use of training fields and casual booked use incorporates schools, small tournaments and individual games.¹

With the establishment of the Auckland Council there is an exciting opportunity for the council to develop a vision and comprehensive strategy that will ensure that physical activity and sports is an integral part of all Aucklanders lives. In 2005 the Auckland Regional Physical Activity & Sport Strategy (ARPASS) 2005 – 2010² was developed in association with Sport and Recreation New Zealand (SPARC). In recognition of the need to improve health outcomes for Aucklanders (reports indicate that only 1 in 5 New Zealanders are achieving the minimum half hour of physical activity per day required for a healthy life) they focused on Auckland becoming a region where physical activity is a way of life. The Auckland Council is able to support this objective through the development of a new benchmark in sports fields that will deliver to its communities affordable, sustainable, high quality sports fields now and into the future.

Cervadon has committed significant time and resource between 2008 and 2010 in assessing the quality and performance of sports fields in the Auckland region. The scope of our investigation has included:

- 1: What type of grass variety is being used, why, and with what results.
- 2: What type of field is being used, why, and with what results.
- 3: How are the fields being maintained and managed.
- 4: An assessment of the quality of the sports field surfaces.
- 5: What play hours were available.
- 6: How long fields were closed due to poor surface and/or renovation.
- 7: Consultation with stakeholders (sports clubs) what do they prefer and why.
- 8: The use of technological field-testing equipment to assess field surface quality and sports field profile.

3.2 Auckland Region's Climate

Monthly Averaged Rainfall Auckland 2000-2010 (NIWA)

Auckland monthly average rain fall mm (total rain fall in ten year 10,433.5 mm)

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
61.62	64.28	63.65	68.82	132.0	115.83	128.33	87.85	78.85	105.72	53.1	84.04

Monthly averaged Temperature for Auckland 2000-2010 (NIWA)

Auckland average air temperature degrees Celsius.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
19.70	19.63	18.93	16.42	14.2	11.99	10.45	11.71	13.26	14.24	15.87	18.07

While the debate about global warming continues we can draw some conclusions about the impact climate change is currently having on New Zealand. Scientists agree the earth is in a warming cycle. Australia, for example, has suffered over a decade of severe droughts which have been described as the worst in 1000 years³. As a result, the Australian government at national, federal, and local government levels has investigated how to improve its turf and sports ground assets so that they can handle these climate conditions. This has allowed their councils to keep fields open for sport and other physical activities.

NIWA has advised that New Zealand is getting warmer. By the end of the century Wellington will follow Auckland's current weather patterns and Auckland will be 2 degrees warmer⁴. 1 in 100 year storms will become 1 in 50 year storms.

¹ Sports Field Management, Provision & Capacity Issues Report. Auckland Council. June 2011

² ARPASS / SPARC Reprt 2005-2010

³ Australian Report

⁴ NIWA Report

For councils maintaining traditional sports fields in particular, the biggest concern is the reduced rain in spring and autumn which causes problems for renovation and constrains the germination of Ryegrass. Accordingly, when considering best practise models it is essential to consider changing climate patterns.

3.3 Auckland's sports fields

Most sports fields in Auckland have poor surface quality. This adversely affects sports player's overall playing experience and means the opportunities for skill development are significantly reduced. At the same time, injuries and field closures are increased which create barriers to Aucklanders being able to participate fully in physical activity. This has a long term negative impact on health outcomes for the people of Auckland.

Historically, many councils in the Auckland region have taken a short-term view in relation to investing in sports fields. Officers advice has tended to focus on cost savings, rather than how to achieve optimal recreational and sporting outcomes for their communities. Use of incorrect grass varieties with inappropriate design and maintenance plans ultimately compromise sports field quality, which ultimately leads to reduced training and play and high rates of field closure.

Some councils have chosen to use naturally occurring grasses (such as Ryegrass and Kikuyu) because of the mistaken belief that they can provide councils with quality cheap sports fields. However, these grass varieties cannot handle hard wear and require expensive, time consuming and on-going maintenance to bring fields back up to an adequate standard from poor condition due to high wear over winter. This is illustrated by field renovation taking two to four months.

Costly renovations are compounded due to the large amounts of potable water required to regain grass cover on fields undergoing renovation with inappropriate grass types like Seeded Kikuyu and Kikuyu. Additionally, there are issues when city service providers use poor maintenance techniques, needlessly wasting ratepayers money. These include incorrectly applying the wrong chemicals; soil sod patches in sand carpet profiles that shorten their life and their ability to drain; unnecessary surface compaction from heavy renovation machinery and insufficient attention to irrigation systems.

See page P53-55 - Examples of poor maintenance and asset management

An associated issue is field type. Continuing to use soil fields that do not have the capacity to drain in Auckland's winter climates without the right drainage systems will lead to ongoing problems (see Rainfall Table May-July pn pg6). In addition, using sand carpet fields in combination with unsuitable grass varieties and out-dated sports field maintenance and management practices means that these fields will continue to under-perform with unnecessary costs. However the highest cost is paid by the people of Auckland who cannot use their valuable sand carpet sports field assets because they are closed. It is our view that the turf industry has been slow in using warm season grass varieties and adopting modern sports field

A comparison between conventional fields and *Supreme Sportsfields* are summarised in the following tables:

MOST COMMONLY USED AUCKLAND SPORTS FIELDS	
Grass varieties used	Kikuyu (seeded or un-seeded)
	Ryegrass
	Kikuyu and Ryegrass
	Fescues
Field types	Soil
	Sand carpets
Spring renovation downtime	8 to 16 weeks of field closure
Spring renovation water use	High
Total spring renovation cost	High

SUPREME SPORTSFIELDS	
Grass varieties	Couch (AgriDark)
Fields types	Sand carpets
Total annual renovation downtime	4 days (no field closure)
Total renovation water use	Low
Total renovation cost	Medium

design, maintenance and management techniques. We are concerned that relying on out-dated practices will impact negatively on Auckland Council's aspirations for 100% playability on weekends. We are aware of the misconception amongst some Auckland agronomists that maintaining top quality sports fields is unsustainable primarily because service providers lack the technical knowledge and experience to manage and maintain quality fields. However, using the *Supreme Sportsfield System* will ensure that the relevant information about how to establish and maintain top quality fields is readily available.

The importance of investing in the value of the asset over its lifetime cannot be overstated. Some councils in the Auckland region have taken a longer term view and invested strategically in their assets. As a result they have been able to establish a number of top quality sports fields with lower costs per playing hour. With the establishment of a single Auckland Council there is an opportunity to draw on the experiences of the former councils to ensure a consistent approach to the development of top quality sports fields for the entire Auckland regional approach.

Attached as Appendix A are photographic comparisons of grass varieties and field types. P24-31

3.4 Grass Varieties

3.4.1 Cool Season Grasses

3.4.1.1 Ryegrass, *Lolium* (C3)

Ryegrass is a native plant to Europe, Asia and Northern Africa and there are annual and perennial types. Ryegrass is one of the better performing cool season grasses and new varieties (e.g. perennial high endophyte varieties) are yielding improved results on sports fields.

The issues with Ryegrass include:

- Annual sowing is required for cover
- Does not handle hard wear
- Requires significant levels of water - the estimated annual water irrigation cost to provide a top cover in Ryegrass is \$30,000.

Recommendation: Ryegrass should only be used on stadiums and No 1 grounds as an over-sow option for cosmetic reasons in conjunction with a couch grass. The combined root matrix of couch and Ryegrass creates an excellent surface for play. An annual Ryegrass should be used and must be sprayed out each summer.



Ryegrass, *Lolium*

3.4.1.2 Fescues, *Festuca* (C3)

Festucae is a genus of about 300 species of perennial tufted grasses, belonging to the grass family Poaceae (subfamily Pooideae). The genus has a cosmopolitan distribution, although the majority of the species are found in cool temperate areas, such as the United States transition zone and Canada. The genus is closely related to Ryegrass. Fescues and tall fescues have also been tried in sports fields in New Zealand but they cannot handle hard wear and do not recover, resulting in blow-outs and field closures.

Recommendation: Fescues should not be used as they are not hard-wearing and require lots of water, during which time the field is closed.



Fescue

3.4.1.3 *Poa annua* (C3)

Poa annua, or annual meadow grass, is a widespread low-growing, tufted, annual plant in temperate climates from America. 'Poa' is Greek for fodder. This grass may have originated as a hybrid between *Poa supina* and *Poa infirma*. *Poa* is self seeding



Poa Annua

and is frequently found in sports fields. However it is unsuitable for sports fields because it has shallow rooting producing an unstable surface leading to player injuries and dies each summer because it is an annual. Poa is hard to remove from Ryegrass fields and is a prolific seeder at nearly any mow height. It will dominate nearly all plant varieties, as well as needing vast amounts of water to keep alive during summer.

Recommendation: Poa annua needs to be eliminated from all fields and proactive efforts made to ensure its complete removal. It should not be allowed to remain *in situ* with other grasses.

3.4.2 Warm season grasses

3.4.2.1 Kikuyu, *Pennisetum clandestinum* (C4)

The tropical grass species *Pennisetum clandestinum* is known by several common names, but most often as Kikuyu grass, and is native to the region of East Africa. Because of its rapid growth and aggressive nature, it is categorised as a noxious weed in some regions. However, it is also a popular garden lawn species in New Zealand and Australia because it is cheap and drought-tolerant (despite it requiring more water than couch and being rough to the touch).



Kikuyu

The NZ Sports Turf Institute and a number of council sports field officers have recommended Kikuyu for sports fields because they believe it is cheap to obtain and look after. We consider that there are inherent problems with this approach as there are a number of disadvantages in using Kikuyu. These include:

- tillers and stolons are extremely coarse compared to couch grasses
- spring and autumn flush growth spurts that require additional mowing which is costly
- an inability to handle hard wear
- an overly soft and chunky surface
- damage from wear breaks down the leaves, exposing runners. This leads to major blow-outs on the exposed bare ground. Low level of root matrix compared to couch
- weeds and Poa (present in Kikuyu fields) die in summer as a result of severe water stress, exposing more ground which becomes unplayable
- additional maintenance repairs as a result of exposed ground, reducing playable hours to only eight – ten hours. Any advantages in not having to deal with weed and Poa are negated by the additional costs of maintaining Kikuyu
- when there is insufficient mowing a sponge mat is formed which cannot be played on
- many sports codes have specifically asked councils not to use this grass type as the surface is spongy, physically draining on player's energy levels, and affects ball control, particularly in football which impacts on skill development
- requires large quantities of potable water following winter to re-establish cover for summer codes
- longer field downtime compared with couch.

Recommendation: Do not use. Costly renovations requiring excessive amounts of water during which time fields are closed.

3.4.2.2 Seeded Kikuyu (C4)

PGG Wrightson has produced a seeded variety of Kikuyu called "Regal Stay Green". It has a mid-green colour with prostrate growth habits. "Regal Stay Green" was placed untrials into Onewa Domain, Beecroft and Mairangi Bay on the North Shore and in our view has performed poorly. The seed is expensive and it does not recover from hard wear, forcing field closures. It also has poor cover in summer after winter use. All the fields on the North Shore using "Regal Stay Green" have been shut down for months of costly renovation. Experiencing rapid growth in spring and autumn, "Regal Stay Green" requires additional mowing compared to other grass varieties. Seeded Kikuyu also requires large quantities of water if used for hard wear sports, and requires more maintenance. This is a very expensive option to manage and maintain.



Seeded Kikuyu

Recommendation: Do not use. Cannot handle hard wear. Fields closed for extended periods during renovation, uses excessive water.

3.4.2.3 Couch grass, *Cynodon dactylon* (C4)

Also known as Indian Doab in New Zealand, Couch Grass in Australia and Bermuda Grass in America. There are two forms available; Diploids (seeded) and Triploids (non-seeded). Diploids and Triploids have evolved differently over time. Diploids have relied on spreading seeds for survival while Triploids have had to develop a dense sward of durable plant material which survives by sending out runners. As a consequence, Triploids can handle hard wear better than Diploids.

Recommendation: Third Generation *Cynodon dactylon* result in higher quality winter sports fields generating higher training and playing hours with a stable surface which is preferred by end users.

3.4.2.3.1 Seeded couch Diploids

Seeded varieties are not as hard wearing and do not come back from wear as quickly as vegetative produced varieties. The seed is expensive and is not typically used in sports fields. The turf sward formed is of low density. Seeded couch plants create pollen potentially aggravating asthma and allergies such as hay fever.

Recommendation: Do not use. Weak surface with a thin sward. Seed is expensive and cannot tolerate hard wear.

3.4.2.3.2 Non-seeded couch Triploids

There are three varieties on the market in New Zealand. This type of grass represents the best choice for sports fields in Auckland because they are:

1. The most drought tolerant.
2. Tolerate the most amount of wear - winter and summer.
3. Hold the surface of the sports field together with a dense root matrix.
4. Transitions out of winter in summer better than other varieties.
5. Vigour is most noticeable when growing stolon – the quicker the establishment, the more vigour the plant has.
6. Self repairing which is the plant's ability to recover or self heal after wear. It is also dependant on rhizome mass and plant density.

3.4.2.3.2.1 B1 "Windsor Green", *Cynodon dactylon* (1st generation) Australian Product

"Windsor Green" is a couch grass from Australia, originating from Wintergreen which came from Greeleas Park Couch. It is a fine leaved semi-dwarfed couch which is slower growing than other couches with an inconspicuous seed head. The slow growth patterns are consistent with the slow senescence of leaf leading to slightly longer winter colour, but this feature means it has poor recovery in sports fields. It has a place as a golf course grass but tends to thatch up. "Windsor Green" has a horizontal leaf growth, an average stolon internode length of 15mm, light green colour, and is slowest out of dormancy. It is not typically used on sports fields as it doesn't recover quickly enough from wear. It has a rhizome root matrix of approximately 20-30mm of root matrix. The slowest triploid to establish from stolon (low vigour) with some fields established from stolon taking longer than two years to achieve full cover. It is the last of the three triploids to break winter dormancy by up to four weeks or more.



Windsor Green

Recommendation: Do not use. Does not recover quickly from winter wear as the plant was selected inadvertently for slow growth as the tillers of the plant senesce slowly, thus the plant has low vigour.

3.4.2.3.2.2 B2 "Legend", *Cynodon dactylon* (2nd generation) Australian Product

Originated from Australia and is a cousin to "Windsor Green". It has a blue green colour with prostrate growth habits. With medium shoot density and medium leaf texture "Legend" has an average stolon internode length of 21mm. It has medium seed head production with large stalky seed heads. Rhizome root matrix is approximately 20-30mm of root matrix. Due to the medium to coarse nature of its leaf and stolon it blows out and needs ongoing repair. It has medium vigour, and fields established from stolon on average take 12-16 weeks to achieve full cover.



Legend

Recommendation: Can be used in low to medium wear sports fields, but not in fields which have high or intense play and training requirements as this will blow out due to coarse and open nature. The plant has medium vigour. Not appropriate for use in sand carpet football fields (wear factor is too high).

3.4.2.3.2.3 B3 "AgriDark" *Cynodon dactylon* x *C. transvaalensis* (3rd generation) New Zealand Product

Bred in New Zealand, parent stock from Asia. "AgriDark" has the finest stolon and leaf on the market, dark green colour, vertical growth, hard wearing. Its vertical growth helps with low thatch accumulation. With high shoot density and fine leaf texture, "AgriDark" has an average stolon internode length of 10mm. It has a low seed head production with fine sized seed heads produced compared to other varieties. Rhizome root matrix is approximately 40-80mm of root matrix.



AgriDark

"AgriDark" has the shortest winter dormancy of all the triploids. It also has the highest natural vigour of the triploids and therefore has excellent recuperative characteristics from wear. It can be used in high to intense wear sports fields experiencing up to 20 hours of play and training per week. If managed and maintained properly it will not blow-out under these conditions. Fields established from stolon on average take 8-12 weeks for full cover.

For any sports field with high winter and summer use and short change over periods between codes, renovation is cost effective and more easily achieved, with renovation able to be completed in two days. Further renovation can occur if needed when the fields are not in use over the Christmas holiday break.

"AgriDark" requires 66% less water than cool season grasses, and 20% less mowing annually with a corresponding reduction in carbon footprint, making it a more sustainable option. In addition it is a sterile plant, and therefore has no pollen which is beneficial for those who suffer from asthma and allergies such as hay fever.

"AgriDark" Couch has an anti-skid characteristic. AgriDark leaf has 30% dry matter, which improves this non-slip ability. In comparison, Ryegrass has 19% and clover has 10%.

Recommendation: "AgriDark" is the essential component of a *Supreme Sportsfields* and is the recommended grass variety option for Auckland sports fields. The most vigorous couch grass with a fine dense sward that handles extreme wear and protects the surface of the sports field.

Attached as Appendix B is a technical comparison of warm-season grass sand carpet sports fields, demonstrating sports field analytical techniques such as field profiling and shear vane testing. Both examine sports field surface stability. P35-39

3.5 Playing field types

3.5.1 Background

Traditionally, playing fields have been built using a combination of soil and clay substructure. This is because they have often been built on old land-fill sites or rubbish dumps which have been capped with clay. These sports fields have ongoing problems with drainage exacerbated by less frequent but heavier rainfall in winter, and less rain in spring. Under these conditions sports fields have struggled to cope with draining the large amounts of rainfall from its surfaces.

3.5.2 Soil playing fields

Soil fields, particularly those that contain clay, will not deliver on Auckland Council's aspirations for 100% weekend playability because they are limited in the amount of play and training they can handle. These fields (which are often described as "boggy") drain poorly and inevitably provide sub-standard surfaces for players.



Soil Field at Cox's Bay Reserve



Same field converted to sand carpet

The switch from soil fields to sand carpet fields cannot be over emphasised for the improvement in quality of surface or the heightened positive experience for the players. A sand carpet provides the platform in winter that players love to play on producing high-scoring, fast-flowing games with less stoppages. In summer the resilience of the sand carpet surface protects sports players from injuries such as concussions which are experienced on hard soil fields.

A major issue for sports players (particularly elite sportspeople) playing on soil fields is the injuries they sustain as a result of training on soil fields and then competing on sand carpet playing fields. Going into the winter sports season, there are many concussions, grazes, and joint injuries (primarily to the knee and ankle) due to the soil fields still being dry and hard. During winter competition, injuries tend to be lower back, muscular (commonly hamstring), and sprains due to training on soft or "boggy" soil fields and then competing on firm sand carpet fields.

Recommendation: Conversion of soil fields to sand carpet fields is essential. With Auckland's growing population and limited space, soil fields deliver limited hours with a poor quality sports field surface.

3.5.3 Sand carpet playing fields

Sand carpet fields are the correct choice for high performing sports fields when combined with suitable management and renovation practices, because of their superior draining characteristics and resilience (i.e. they do not "bake" hard during summer). However, sand carpet fields must be sown with a fine vigorous couch grass to achieve a top quality sports field (i.e. a *Supreme Sportsfield*).

It is our view that there are only a handful of people working in the New Zealand turf industry who have the knowledge and experience to develop top quality sports fields. Auckland Council is fortunate to have staff with these skills in their employment and we recommend that Auckland Council draws on their combined experience in the development of their sportsfields. We also believe there are only three New Zealand companies capable of designing, developing and maintaining *Supreme Sportsfields* in New Zealand, with Cervadon being one of these.

Critical in sand carpet design is the separation layer of the sand carpet and the base medium - often clay, soil or peat. *Supreme Sportsfields* focus management on water control through the sports field profile. Hydro-conductivity within the sand carpet profile is key as there are often issues with perched water tables.

The *Supreme Sportsfields System* analyses the profile (health check) as part of field audits, allowing early detection of damage and a renovation schedule to be drawn up. A regime of early detection, for example of the build up of organic matter, saves councils money over the long-term as they will not be required to undertake expensive major renovations.

Specific recent design developments from *Supreme Sportsfields*, includes;

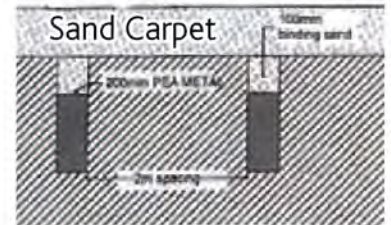
1. By-pass shut off field valves that allow irrigation to other fields should a field require maintenance.



Sand Carpet Profile: Sand carpets are designed specifically to drain freely.



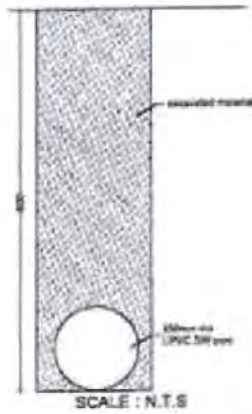
Drainage Plan: *Supreme Sportsfields Systems* have modified drainage in pipe size and spacing.



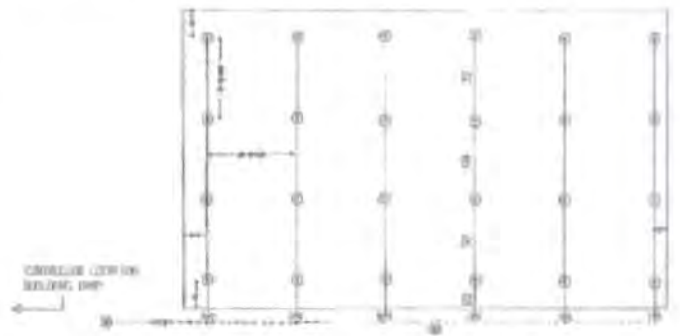
Slit Drains: Collect surface water and move it to lateral drains



Lateral Drains: Move water to collector drains



Collector Drain: Move water to stormwater or irrigation pond



Irrigation Plan: Important aspect of a *Supreme Sportsfield*

2. Lateral drains have been limited to 5 metre spread.

3. Sand quality and level of organic matter is paramount to maintain field surface integrity. Use of lower cost or low grade sands shortens the life-cycle of the asset. A percentage of organic compound is also important. A 5% organic make-up stabilizes the surface, provides nutrition and micro-organisms whilst still allowing free draining characteristics.

Recommendation: Sand carpets are the best option to future proof Auckland's sports fields. To maximise the advantages of using sand carpet fields, the *Supreme Sportsfield System* should be incorporated with the use of sand carpets at the outset.

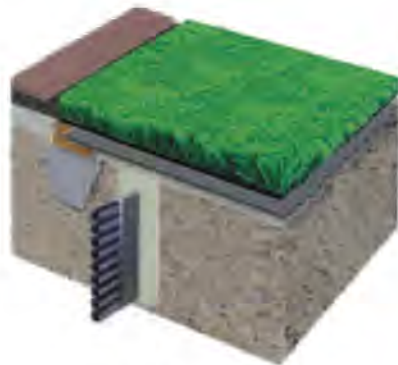
Attached as Appendix C is a technical report illustrating the difference between warm season grasses with sandcarpet, sports fields. P35-39

3.5.4 Artificial playing fields

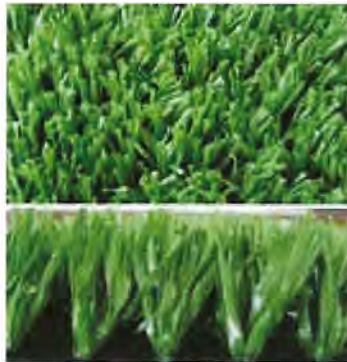
The claims from artificial turf manufacturers about the many benefits of artificial playing fields over natural fields sound plausible, however careful analysis indicates that many of their claims cannot be supported. Thus, while the latest third and fourth generation artificial playing fields could provide part of Auckland Council's solution for 100% weekend playability when used in conjunction with top performing natural grass sports fields, an in-depth investigation into the advantages and disadvantages of artificial turf is required before investing heavily in these fields. In early 2011 *Supreme Sportsfields* staff joined the NZRA who undertook a field trip to Melbourne examining issues related to artificial turf. The trip highlighted a number of issues discussed in the section.

In assessing whether or not to replace natural fields with artificial playing fields, three key issues need to be carefully considered. These are:

- the initial capital cost – artificial fields are around five times more expensive to build than top performing natural grass fields (for example *Supreme Sportsfields*)
- the health risks – a number of potential health concerns have been identified with the use of artificial turf, including



Artificial Profile



Plastic Weave



Crumb Rubber
(recycled tyres)

ARTIFICIAL vs NATURAL GRASS COMPARISON

Field type	Cost to Build	Number of fields	Total Hrs of Play per Week	Quality of surface	Annual maintenance	Cost per playing hour
Artificial sports field	\$1.5M	1	40 (1x40)	Good	\$15k	\$67.91
Natural grass, Supreme Sports field	\$1.5M	6	120 (6x20)*	Supreme	\$15k (per field)	\$28.52 with ryegrass oversewn

* Note: These fields can be at different locations and have different sports using them at the same time

significant increases in the temperature of the surface, abrasion and the transfer of infections. Research into the plastic weave (which has potentially high levels of lead) and the crumb rubber (involving potentially high levels of carcinogenic material) in the artificial turf, which provides cushioning for athletes, has raised a number of concerns for health experts and parents alike. The rubber in fields that have been tested contain traces of toxic metals and industrial chemicals that have been linked to cancer and other health problems. In June 2010, New York Mayor Michael Bloomberg approved a requirement that the New York Parks and Health Departments work together to review all material going into artificial playing fields”¹. In an article in 'USA Today' A.J Perez reports on concerns from communities in New York and Los Angeles who are “not prepared to wait for ongoing studies to reveal potential health threats about artificial turf because the health of our students is more important than any other issue”.²

- environmental concerns – these include toxic leaching from industrial chemicals in recycled tyres and the generation of excessive heat from artificial turf.

Artificial turf manufacturers claim that artificial fields require little maintenance, no water and provide cost-effective, high performance playing surfaces. Our research indicates, however, that:

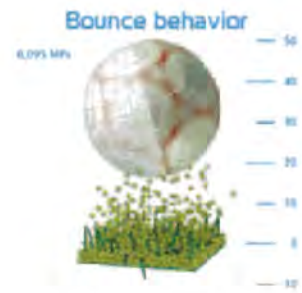
- claims that artificial fields can be used 24/7 are misleading because most people are constrained (because of work, study and other commitments) with the times they are able to train and play. Realistically, apart from weekends, there are only a few hours in the afternoons and evenings that non-professional sports people can train and play during their working week. College Rifles in Auckland, is only booked between 30-35 hours per week per artificial field
- guarantees are often invalidated if play is extended beyond 40 hours per week
- it costs approximately \$15,000 per year to maintain the fields to meet their guarantee conditions which is equivalent to the annual cost of maintaining a *Supreme Sportsfield*. Failure to maintain artificial fields properly will shorten the life of the field and nullify warranties
- College Rifles spends \$35,000 each year for maintenance for two artificial fields
- damage to pitches are expensive to repair



Excess heat from artificial surface with Flexsand infill during the day reaches 66.8°C. Reading taken by G Croft/New York City Parks advocates, 26 May, 2010 at 3.34pm. Black crumb rubber has been measured at 93.3°C.

¹ Navarro, Mireya/ "City Tightens Rules on Artificial Turf"/Green/June3/2010
² Perez, A.J/ "Two Cities Spurn Crumb Rubber in Artificial Turf"/USATODAY/6/10/2009

- they often require expensive fencing to protect the fields from vandalism, accidents, damage from animals, etc. reducing the public's access to these expensive public assets
- they require regular watering to maintain surface levels, stabilise crum-rubber before play, suppress crum-rubber dust from becoming airborne and to reduce the temperature of the surface before play. During the hottest part of the day water evaporates and fails to cool the surface.
- ongoing spraying is required with disinfectants, algacides, mossicides, and weedkillers.
- artificial fields radiate heat at a higher temperature than natural grass fields (natural grass fields remain cool due to transpiration) which is environmentally damaging.
- shock pad underlay is essential to avoid joint and ligament damage to ankles and knees, which adds significantly to the capital cost
- players receive cuts and grazes from the plastic fibres in the artificial turf
- players get fine rubber dust in their eyes, nose and ears, and on their legs
- human detritus accumulates on the surface and does not breakdown so must be cleaned regularly
- boots wear more quickly
- ball bounce is different to natural grass which frustrates football players.



Soccerballs bounce in random directions on used artificial fields due to uneven surface levels of crumb rubber which moves during play.

People prefer to play on natural grass sports fields and many sporting codes have been advocating for an increase in the number of high performance natural grass sports fields. A quadruple bottom line approach must be applied when considering building artificial fields in relation to investigating the true cost of artificial sports fields, the potential health risks and the environmental impact of using artificial turf.

In addition we note that cost per playing hour expense is passed onto the end users in booking fees which ratepayers are struggling to pay.

Recommendation: Artificial fields are a more expensive option on a per player/training hour basis, but can have a role in supporting natural grass fields. Auckland Council may wish to consider the use of artificial training strips, artificial goal mouths or strategically placed artificial hubs in and around city industrial space.

More detailed investigation into artificial turf is required in response to the health and environmental concerns that have been raised about its use.

Refer to Appendix D for a cost benefit analysis of differing sports fields and grass types. P40

Refer to Appendix I for information on maintenance on artificial sports fields, artificial surface testing for ball bounce and an alternative to black crumb rubber. P 60-61



4.0 100% Playability

4.1 Auckland's Sports Field Requirements - what sporting codes want

Sports players from a range of sporting codes have had the benefit of playing on *Supreme Sportsfields* in Waitakere and Rodney and at Bruce Pullman Park. Many codes have stated that they prefer to play on *Supreme Sportsfields* and have been advocating with councils for more of these fields to be established.

Attached as Appendix E are endorsements for the *Supreme Sportsfields Systems* from:

- Auckland and Manawatu Rugby Unions, Rugby League, first class cricket players and administrators, Football, La Crosse New Zealand, Sports field industry members including local government officers, and contractors. P41-49

4.2 Auckland Council leadership – achieving 100% playability on weekends

The establishment of a single Auckland Council provides a much needed opportunity for a consistent approach to be taken when responding to the greater needs of an increasing population desiring higher standards in sports fields.

Councils are financially constrained with regard to sports field development and maintenance. It is vital that Auckland Council responds to the needs of its communities and prioritises investment in this area over the long term of the life of its assets, rather than taking a short term approach which can lead to the rundown of assets and subsequent field closures. Some fields that have been rated as competition fields in 2002 and 2005 are now, in 2010, performing well below standard.

The winner of the best soccer-sand field winter sports competition 2005 was Seddon Fields No 1 which was established in January 2004 in "AgriDark" couch. While Seddon Fields No 1 has some of the components of a *Supreme Sportsfield*, a lack of on-going investment into these fields means that they are not performing to their full potential. In our view these fields need to be managed differently to transform them into top quality sports fields.

The adoption of high standards in sports fields will ensure 100% playability on weekends in Auckland, and long term savings will be made when a consistent approach is taken in relation to renovation and management programmes. Taking a strategic, long term view to sports field design and maintenance, as part of the development of Auckland's Spatial Plan, will ensure that the current and future sport and recreational needs of the people of Auckland are met. This provides Auckland Council with a genuine regional solution for sports fields and best maintenance practice.

Appendix F has extracts from the May 2006 & 2002 NZSTI Turf Management Journal which shows the results of the Sports Field Forum best sports field competition. Warren Freer Park won Best Rugby Sand Carpet in 2002 and Seddon Fields won best Football Sand Carpet, 2005 competition. Both are "AgriDark" Grass. P51-52

4.3 Quadruple Bottom Line - economic, environment, cultural & social outcomes

Cervadon has made a commitment to developing sports field solutions that meet the economic and environmental and social needs of our clients, and to reflect this we have adopted a quadruple bottom line approach to our work. We believe this aligns very well with the goal of local government which is to promote the social, economic, environmental and cultural well-being of communities in the present and in the future, as set out in the Local Government Act 2002 Amendment Act 2010.

Cervadon provides a cost effective regional solution for sports fields in the form of *Supreme Sportsfields*, which have, for example, self-repairing qualities and shorter renovation periods which reduce the overall cost.

Supreme Sportsfields also deliver strongly in relation to the environment through, for example, reduced water use and less mowing, both of which contribute to a reduced carbon footprint. In contrast to artificial turf, *Supreme Sportsfields* (which are natural turf sports fields) can also act as a carbon sink, and through transpiration in the leaf, cool down the urban environment.

In addition, because of the superior performance of *Supreme Sportsfields*, injuries and field closures are significantly reduced, thus enabling the community to participate fully in physical activity, which contributes to positive social interaction outcomes for Aucklanders. Refer P63

*Refer to page 63 data



5.0 Regional Solutions for Auckland Council's Sports Fields

5.1 Background

Traditionally, playing fields have been built using a combination of soil and clay substructure. This is because they have often been built on old land-fill sites or rubbish dumps which have been capped with clay. These sports fields have ongoing problems with drainage exacerbated by less frequent but heavier rainfall in winter, and less rain in spring. Under these conditions sports fields have struggled to cope with draining the large amounts of rainfall from its surfaces.

5.2 How Cervadon can add value

Cervadon has the knowledge and expertise to provide the Auckland Council with *Supreme Sportsfields* and maintain them to a high quality.

Cervadon has:

- over 50 years combined experience working in sports field design and management
- a strong research background
- proven success in the delivery of superior performing sports fields and has developed *Supreme Sportsfields*, a new benchmark in quality, affordability and manageability
- excellent working relationships with councils throughout New Zealand which has allowed us to develop an in-depth understanding of the needs of local government
- well developed working relationships with councils and stadiums in Australia
- developed *Supreme Sportsfield Systems*, a comprehensive management and maintenance system for quality sports fields.

5.3 The new benchmark in sports fields - *Supreme Sportsfields*

For the last 50 years, traditional turf maintenance and management approaches by local government in relation to sports fields has been based around soil fields and the spring and/or autumn sowing of Ryegrass. Higher demands from an increasing population, combined with the adoption of a Metropolitan Urban Limit in Auckland to combat urban sprawl, have resulted in few green field sites being available for development. This has led to councils, and the community, asking more from existing fields in terms of performance.

New advances in sports field technology, including the use of sand carpets and changes in design to improve drainage, have enhanced player experience and considerably increased the number of hours available for play and training. In winter, traditional soil fields only provide 4-8 playing and training hours on average compared to *Supreme Sportsfields* (that are only limited by grass wear) which are able to provide over 20 hours of play and training per week in both summer and winter. More importantly, the natural resilience of *Supreme Sportsfield* playing surfaces has been proven to reduce the frequency and severity of injuries sustained by sports players.

Some of the latest advances include:

- reducing the sand layer from 300mm to 100mm
- combining sand with loam and sand top dressing
- changing the spacing in drainage, pumps and sump holes off field
- designing the surround field space to keep water off fields
- the use of stormwater run-off from car parks, buildings and footpaths, and recycling that water for irrigation

- developing and maintaining the full template for fields and surrounds to guard against infiltration of cool season grass and weed seed.

All these factors represent major advances in sports field design, producing better fields more economically over the life cycle of the asset. *Supreme Sportsfields*, if managed and maintained properly, will not need renewing in the future.

Traditional cool season grass varieties commonly used overseas in the past are no longer being used in countries such as Australia. Water is increasingly viewed as a valuable resource and it is considered unsustainable to continue with traditional cool season grasses like Ryegrass because of the need for extensive irrigation to keep the grass alive in summer.

Australia commonly uses new warm season grass varieties, primarily couch grass, in response to Government directives for increased water-use efficiency. This type of grass is used in stadiums and sports grounds throughout Australia and has become the new standard for hard wearing, quick recovering, strong stable turf. Following good results achieved in New Zealand, where it has been in use since the early 1990s "AgriDark" couch is being trialed in the ANZ Stadium at Olympic Park in Sydney, Skilled Stadium in Gold Coast, and SunCorp Stadium in Melbourne.

Improvements in field management and maintenance has seen the emergence of a new benchmark in sports field design, management and maintenance in the form of *Supreme Sportsfields*, which are currently being used in some parts of Auckland. These sand carpet fields provide all year round top quality surfaces for sports players that sports administrators and operational staff are also finding beneficial. We consider best practice in management and maintenance vital to lowering the cost per playing hour for rate payers and retaining quality in assets.

Lower renovation costs, lower water use and reduced mowing requirements are amongst some of the direct benefits of *Supreme Sportsfields*. Other benefits include lower carbon emissions and renovations completed within two days over spring and further renovations over the Christmas period when the fields are not in use. Traditional fields are taking between 8 to 16 weeks to renovate with additional costs in machinery, labour and petrol. More importantly there is a cost to the community as a result of field closures during this renovation downtime. At the start of the 2010 winter sports season, 16 sports fields were out of action due to poor grass species and soil types. *Supreme Sportsfields* are also easy to manage through transitional periods in sports from winter to summer, and back to winter codes.

5.4 "AgriDark" couch grass (3rd Generation)

Cervadon has developed a superior couch grass for sports fields called "AgriDark". "AgriDark" was developed in New Zealand by Dr Hunt over a 20 year period during his tenure as a Senior Scientist and Team Leader in the Turf Division at AgResearch.

"AgriDark":

- is drought tolerant
- requires 66% less water than Ryegrass and other cool-season varieties (subsequent reduction in irrigation costs)
- requires approx 20% less mowing annually compared to Kikuyu or Ryegrass (reduction in cost and carbon footprint)
- is well suited to New Zealand's climate-temperate weather
- has fine leaf and stolon (10mm internodes)
- is an attractive dark green colour
- has vertical growth which helps with low thatch accumulation
- provides a stable surface to play on which significantly reduces injuries
- can handle high wear without blowouts that lead to field closures, if managed and maintained properly, will increase playing and training hours per field significantly
- is self repairing which also significantly reduces field closures
- is sterile and has no fertile pollen. It therefore has a low allergy rating for asthma and hay fever sufferers
- has the shortest winter dormancy of the couch triploids, therefore recovery from winter wear is quick and costs less
- has high vigour and fields established from stolon on average take 8-12 weeks for full cover
- provides full cover for summer and winter sports with robust resilience (bounce) reducing injuries
- has a high dry-matter content that is conducive to sure footing.

With the highest natural vigour of the couch triploids, AgriDark has excellent recuperative characteristics from wear. It can be used in high or intense wear sports fields, providing over 20 hours of play and training per week.

Attached is Appendix B, a comparison of "AgriDark", Kikuyu and other couch grasses. P32-3533

5.5 Regional Solutions: The *Supreme Sportsfields System*

The *Supreme Sportsfield System* incorporates a specific couch grass, a specific sand carpet and a specific irrigation system. *Supreme Sportsfields* set a new benchmark in sports fields. They deliver a top quality sports field surface which allows increased playing and training hours per field at a similar economical cost to traditional fields. Cost per playing hour reduces when compared to traditional fields as they require less maintenance. Traditional field renovation costs are often added as extra onto existing contracts, costing councils large sums of money. Which are not reflected in a true per-playing-hour cost.

The *Supreme Sportsfield System* features new design, establishment, maintenance and management practices that give players greater levels of satisfaction, with benefits for operational and administrative staff alike. Maintenance is easy to perform with less impact on summer and winter codes as they transition through the year. *Supreme Sportsfields* represent the most economical solution to Auckland's ever increasing need for top quality sports fields by optimising the usability of existing fields, and reducing the need to build new fields.

SAVINGS FROM REDUCED MOWING

Grass type	Cuts per year required	Cost per hectare per year(sports field)
Rye grass	52	\$6240
Kikuyu*	52	\$6240
AgriDark couch	38 (often less)	\$4560

Savings: \$1680 per field per year. Therefore 700 AgriDark fields would save \$1,176,000 annually compared to Ryegrass/Kikuyu fields

NB: Figures are based on the cost of cutting 1 field (hectare) at the rate of \$120

* Kikuyu places the biggest load on machinery with additional costs in machinery maintenance.

Refer to Appendix D for a cost benefit analysis of different sports field and grass types. Pg 40.

To complement the *Supreme Sportsfield System*, Cervadon is able to:

- share information learnt from the International councils we work with
- help organise forums on warm season grasses with relevant speakers from New Zealand and Australia
- deliver workshops for Auckland Council staff with experts in field design and management, to up-skill staff and share information
- assist in the development of future contracts between Auckland Council and its sports field service providers
- identify opportunities for key Auckland Council Managers and staff to share best practice models for sports fields, including how to achieve 100% playability on weekends, at conferences and other speaking engagements
- develop a comprehensive manual on warm season grass, sand carpet, sports fields for Auckland Council staff (see below).

Best Practice: Manual

The *Supreme Sportsfield System* is not currently being used to its full capacity in Auckland. Cervadon is able to draw together all aspects relating to the *Supreme Sportsfield System* into a comprehensive manual for Auckland Council's use. Using the 2009 – 2010 Technical Report on Auckland's Sports Fields as a base document, the manual for Auckland Council's sports fields could include information about:

- 1) Standards for -
 - a) Field goals, goal posts, flags etc
 - b) Movable football goal mouth for side field use to spread load
 - c) Off-field utilities; drinking stations; rubbish bins; and toilets etc
 - d) Movable lighting for training or alternate lighting with switch off points.
- 2) Quality control auditors trained to evaluate the new benchmark



- 3) The tests to be included in annual audits relating to condition and performance of the sports field surface and profile using the following methods -
 - a) Cleg hammer
 - b) Shear vane
 - c) Hydraulic conductivity (pore spacing in field profile)
 - d) Renovation inspections
 - e) Visual (photographic history)
- 4) A stakeholder feedback loop which would -
 - f) Include a surface performance report, about the condition of sports fields for play (similar to that used by the cricket code)
 - g) Coordinate information posted on a website to be developed by Auckland Council
 - h) Summarise information about weekend play provided by managers and coaches and independent feedback from referees.
- 5) Cost saving renovation guidelines for inclusion in new contracts with service providers as these come up for renewal. This information is summarised in the table below.

SUPREME SPORTSFIELDS SYSTEM RENOVATION METHODS						
Renovation	Timings	Frequency	Brands	Acceptable costs	Best methods	Best standards
1. Sprays	x	x	x	x	x	x
2. Mowing	x	x	x	x	x	x
3. Fertilising	x	x	x	x	x	x
4. Solid core tyning	x	x	x	x	x	x
5. Hollow core tyning	x	x	x	x	x	x
6. Scarifying	x	x	x	x	x	x
7. Verty- cutting	x	x	x	x	x	x
8. Sand top-dressing	x	x	x	x	x	x



6.0 Auckland in the field

On the 6th of December 2010, Cervadon co-ordinated a field trip for Auckland Council to investigate the state of Auckland Council's sports fields with a view to improving quality and usage. Parks that used a range of grass varieties and field types were chosen for inclusion in the field trip, with the focus being primarily on sand carpets.

The fields inspected and the various states they were in, were representative of the approach taken by the former councils in the Auckland region and the results achieved. The information gained from the field trip will be useful for evaluation purposes, and the results can be used to inform the development of a best practice model for sports fields for Auckland in the future.

[View table in appendix H on pg 56-59](#)

Mismanagement of couch sand fields is a common occurrence. Sportsfield models that require less maintenance and renovation if correctly managed will save Auckland council large amounts of money.

Results: During the field trip there was the opportunity to see a wide range of sports fields. The quality of the fields ranged from unusable and closed, to excellent, with *Supreme Sportsfields* being in the top category. It is our view that *Supreme Sportsfields* are the only fields that meet the highest standard of surface quality and usability and could become the new benchmark for Auckland's sports fields.

Recommendation: In order to improve playability, reduce costs and injuries and achieve 100% playability on weekends, Auckland Council should actively consider putting in place a programme of field renewal and the building of new fields using *Supreme Sportsfields* model. This is a regional solution using a best practice model, producing cost effective quality sports fields for all Aucklanders.



7.0 Conclusion

Auckland Council aspires to have 100% playability on sports grounds on weekends. In order to achieve this, the council must find solutions for the problems it is currently experiencing with:

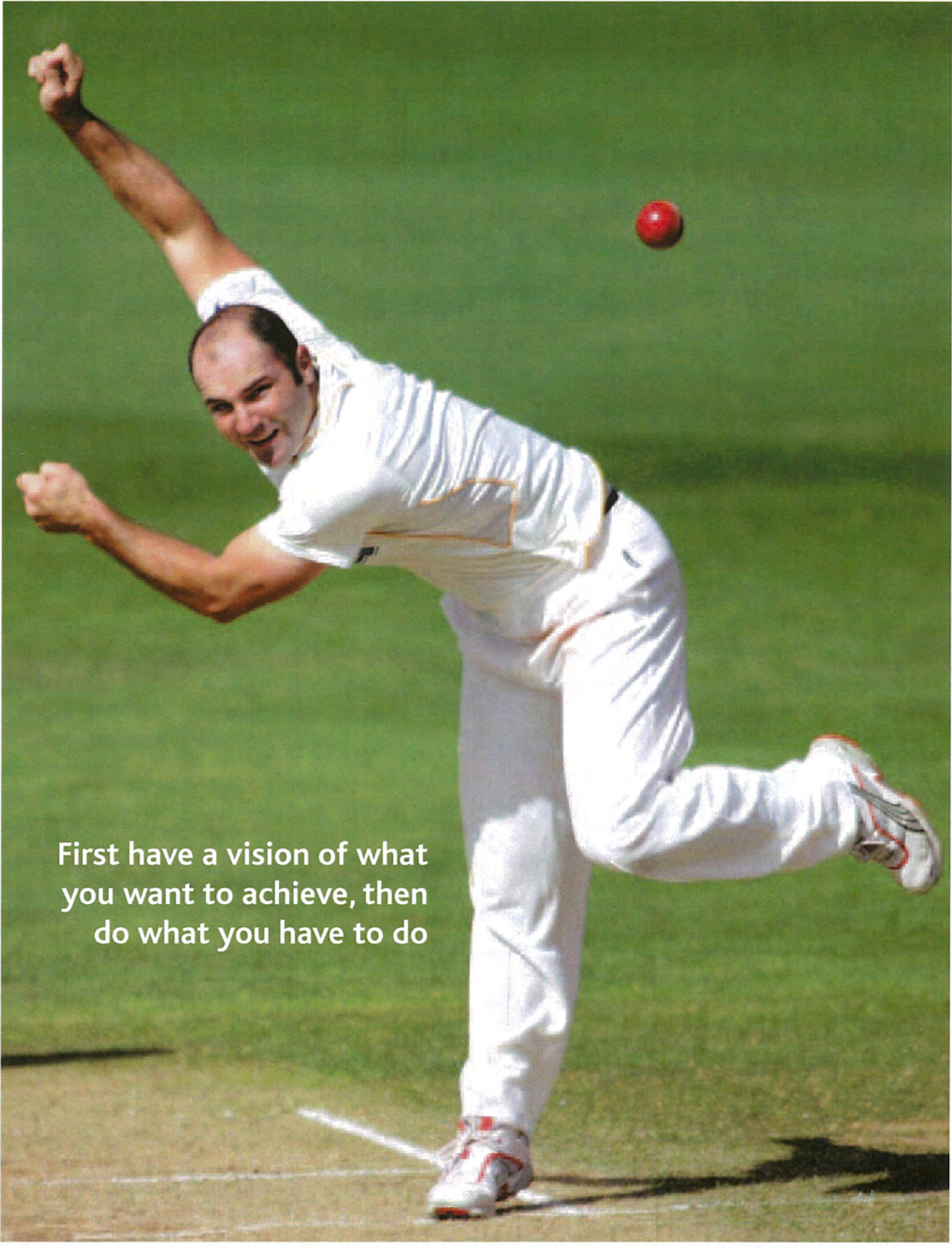
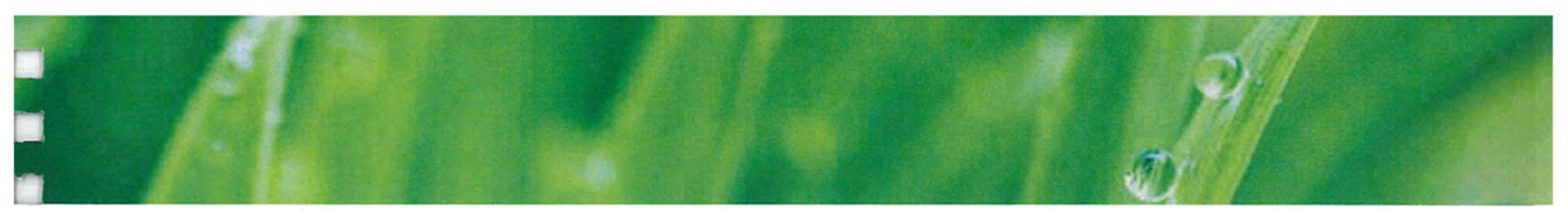
- poor quality fields leading to high levels of field closures
- population growth with a corresponding increase in sports field demand
- barriers to the community being able to participate fully in sport and recreation due to closures and increased demand
- higher expectations around value for money and a focus by communities on the quality of their sports field assets
- few opportunities for greenfield sites placing a heavy reliance on existing fields.

Cervadon offers a complete regional solution for Auckland Council with its *Supreme Sportsfield System*. *Supreme Sportsfields* are a sustainable, cost-effective option which provides:

- more play and training hours per week – with some fields providing up to 20 hours
- 100% playability on weekends
- reduced water use which lowers costs and is better for the environment
- top quality surfaces requiring less renovation thus providing increased playability
- reduced field closure for renovation - *Supreme Sportsfields* are closed for only a few days for renovation while Ryegrass and Kikuyu fields are closed for months
- reduced renovation costs – fewer renovation days represents significant cost savings for Auckland Council
- attractive, natural fields without any of the potential health issues associated with expensive, artificial grounds
- sand carpet fields which have superior draining and do not 'bake' hard during summer
- reduced injuries to players - tight sward and full grass cover reduces grazes; stable turf surface reduces hamstring and lower back issues associated with training on poor soil fields then playing on firm pitches; resilience (bounce back) in fields leads to fewer head injuries and concussions experienced with soil fields in summer which have hard ground (which is especially prevalent in preseason games of rugby and rugby league)
- Reduced mowing.

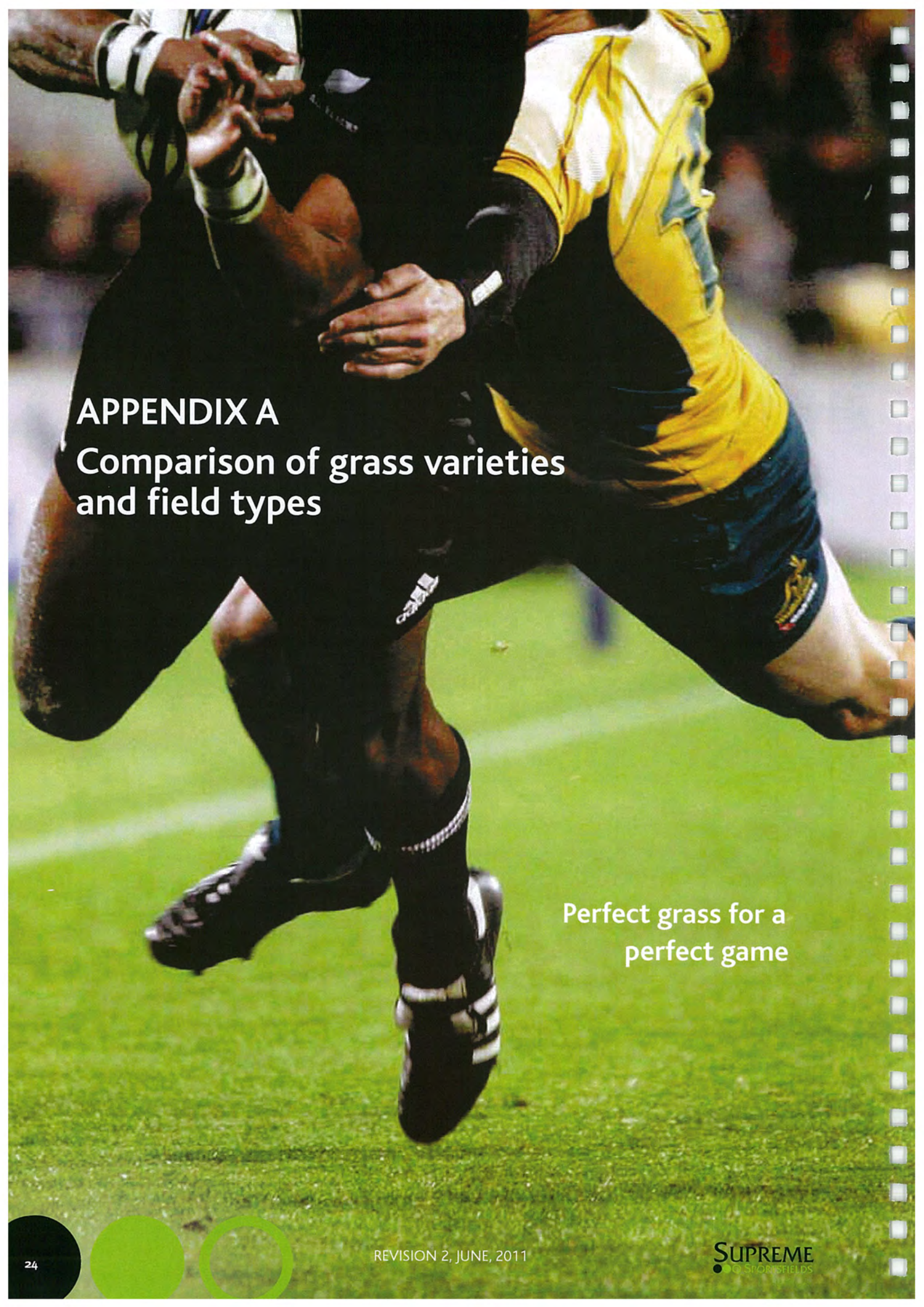
This is an exciting time for Auckland following the establishment of a single Auckland Council and there are high expectations from the Auckland community, from casual sports players to sporting codes, that the new council will deliver better results for them.

Cervadon would be pleased to use our 50 years of combined experience in sports field design and management to partner with the Auckland Council. We can help the council achieve excellent sporting and recreational outcomes, and 100% playability on weekends, through the adoption of a new regional solution *Supreme Sportsfields* as the new benchmark in top quality sports fields.



First have a vision of what you want to achieve, then do what you have to do





APPENDIX A

Comparison of grass varieties and field types

Perfect grass for a
perfect game

Ryegrass and Poa annua on Soil sports fields

Council Example: Summer surface - Highbury Park (Palmerston North), March 2008



During summer ryegrass cover is difficult to maintain unless the field is fully irrigated. Injuries occur which become barriers to participation and are costly. Hard grounds injure heads and legs. Pre-season games of rugby have resulted in grazes, ankle and knee injuries and concussions.



From a distance cover looks acceptable. Up close you can see the lines from direct drilling ryegrass which has failed to germinate and the cuts in the surface have opened up. These become dangerous and can cause injuries to ankles.

Winter surface - Lloyd Elsmore Park (Auckland), September 2010



Soil fields often struggle to shed excess water from heavy winter rainfall. Poor soil substructure, often clay, combines with compaction and fine soil particles to blocked natural pore spaces through the field profile for water to drain. This prevents future grass growth as roots of plants cannot breathe. Wear intensifies and soil is shifted causing pooling in area to intensify. Fields become unplayable and are often closed.



Sections of the field which fail to drain but don't pool water offer loose grass cover which in turn offers poor stability for players and can cause injury through slippage and hyper extension. This weak area in the field will blow out needing costly maintenance often leading to field closure.

Ryegrass and Poa annua on Sand Fields

Summer surface - Keith Hay Park (Auckland), March 2010



In this view of the surface the lack of ryegrass cover is obvious and will not recover until more seed is introduced going into winter. Exposed ground weeds are able to grow which will need to be removed. Increased maintenance costs.



In this close-up of the surface the lack of ryegrass cover is obvious and will not recover until more seed is introduced going into winter. With exposed ground weeds are able to grow which will need to be removed. More expensive renovations.

Winter surface - Becroft Park (Auckland), September 2010



This field was originally seeded in Fescue which failed and has since had ryegrass sown which is now competing with Poa annua. These types of grasses cannot handle hard wear. In front of this soccer goal mouth the field has worn thin needing extra irrigation and renovation, allowing more Poa annua to germinate which provides a poor service and leads to blow outs.



On this field you can see the damage caused by one foot slipping which has pushed out the shallow rooting Poa annua. It would not be long before further areas weaken in the field under high wear, and maintenance will be required with the introduction of more Ryegrass seed. This will require the field to be closed.

Kikuyu, Ryegrass and Poa annua on Soil Fields

Summer surface - Keith Hay Park (Auckland), March 2010



Councils have continued to invest in this grass type. Watching children play cricket on this surface was disappointing. No real skills could be developed in bowling, batting and certainly not fielding. The risk for injuries remains high as all grass forms struggle to survive.



As the Poa annua and ryegrass die with the lack of water the ground provides a poor open surface. The Kikuyu is unable to recover from winter wear, and with the lack of water in summer, is unable to fill in the open ground. These fields provide poor summer sports fields for all.

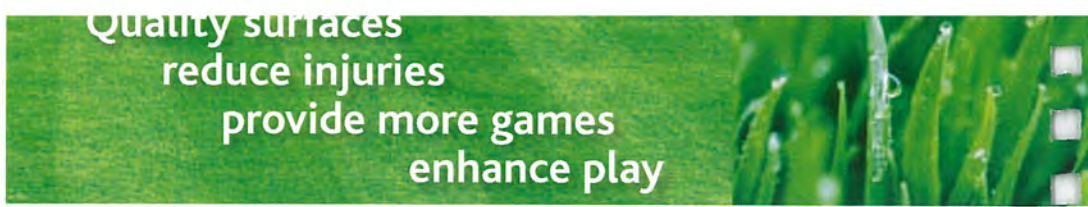
Winter surface - Keith Hay Park (Auckland), August 2009



This photo was taken on a dry winter day. The damage evident in the goal mouth and extending into the field is so severe, that with rain this field would close. Aside from field closure there is reduced skill development, lack of satisfaction in being able to play, and potential for injuries. Kikuyu cannot handle hard wear.



The best areas in the field still show wear and tear, which delivers an unstable surface to play sport on. Soccer players complain about the interference with ball control on Kikuyu fields.



Kikuyu, Ryegrass and Poa annua on Sand Fields

Summer surface - Seddon Fields (Auckland), March 2010



The No 4 ground at Seddon Fields is Kikuyu and has failed from the outset. Requiring much more water and maintenance than the couch fields next to it, this field has not performed. Surface stability is poor.



Areas on the field are so bad they are described as a sand-pit. The natural kikuyu cannot handle the winter wear and fails to recover for summer sports. This field is closed most of the time and is a frustration for the soccer club that uses it.

Winter surface - Becroft Park (Auckland), November 2010



This field was sown in "Regal Stay Green", a seeded kikuyu variety. The field has been closed for extensive renovation as the surface damage was so great the field became unusable, and was closed for 7 weeks. This type of grass is unsuitable for sports fields.



This training area receives extensive wear under lights. However the damage is so extensive, it is now receiving costly renovations to bring back the area so it can be used as a training ground.

Couch and Poa annua on Soil Fields

Summer surface - FMG stadium No 2 ground (Palm North), March 2009



During the 2008-2009 summer the No2 ground at FMG stadium in PN was changed from a Ryegrass and Poa annua field to an "AgriDark" couch and Poa annua field. Full cover was achieved in ten weeks.



This close-up is of the surface after eight weeks. The ground was not played on at this time.

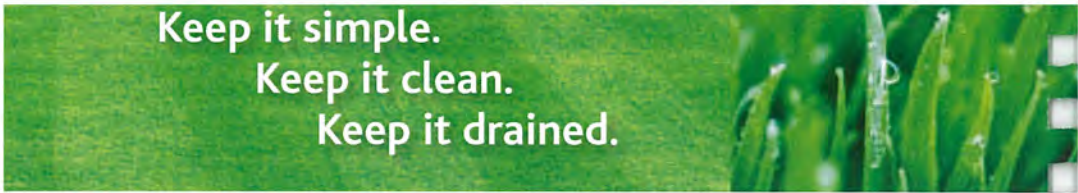
Winter surface - FMG stadium No 2 ground (Palm North), August 2009



Poa annua grew back to cover most of the field and despite the unusual look, the field was rated by the Manawatu Rugby Union as the best field to play on in 2009. Better than the number one field. Players, coaches and team managers all made comments to the union about the superior surface.



Close-up of "AgriDark" during winter dormancy with Poa annua growing through the surface. The surface provided sure footing, reduced injuries and scrums did not collapse.



Couch (mono culture) on Sand Fields

Summer surface -Bruce Pulman Park (Papakura) *Supreme Sportsfield*, March '09



Summer codes prefer to play on this type of surface because of its superior surface. They can start play earlier in the year because the shorter renovation window means the field does not need to be closed. Two days for renovations after winter sports and another two days around Christmas. This encourages participation in sport and keeps sport users active.

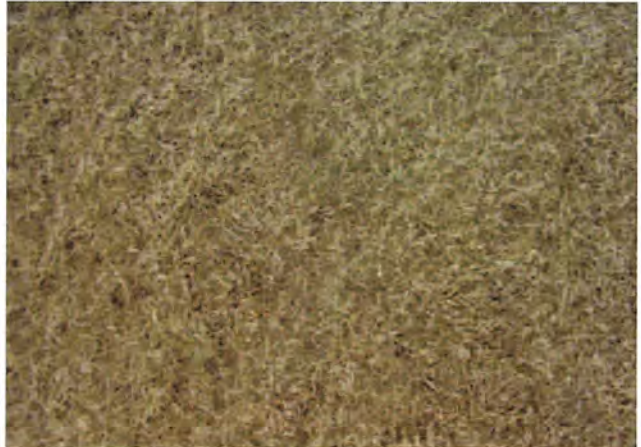


Cricket and Lacrosse find this surface the best to play their sport on. The fine couch allows for better ball control for Lacrosse and they can stop, start, turn and pivot to the best of their abilities. Cricket players can attack the ball in the field without having concerns for injuries and score runs as the ball travels well on it.

Winter surface - Bruce Pulman Park (Papakura) *Supreme Sportsfield*, March '09



Couch mono-culture couch grass will brown off under frosts during winter dormancy. The field in this picture was in use and receiving over 20 hours of use from the "Steelers" during the day, trainings at night, and weekend games. Despite the intense use the surface remained intact. These fields never closed in winter.



A close-up of the surface shows a healthy sward of couch grass which is a pleasure to play on. Winter codes enjoy the stability the tight dense surface provides which encourages players to step with the ball rather than kick or pass the ball as they do on fields which don't give them the same confidence.



Couch and Ryegrass on Sand Fields

Summer surface - Bruce Pulman Park (Papakura) *Supreme Sportsfield*, Mar '09



Touch rugby players enjoy playing on these fields compared to all others. They are able to dive for the line, reach out when chasing players, and fall without injuries. They can start and stop on the spot knowing they will not fall over and love to run on the firm well groomed surface. Rugby players do not experience concussion as these fields have a high level of resilience.



Complete grass cover such as this field at Bruce Pulman Park is something many sports players have not experienced. Quality fields encourage participation, protect participants from injuries, and are always open to play on in winter and summer.

Winter surface - Bruce Pulman Park (Papakura) *Supreme Sportsfield*, Aug '10

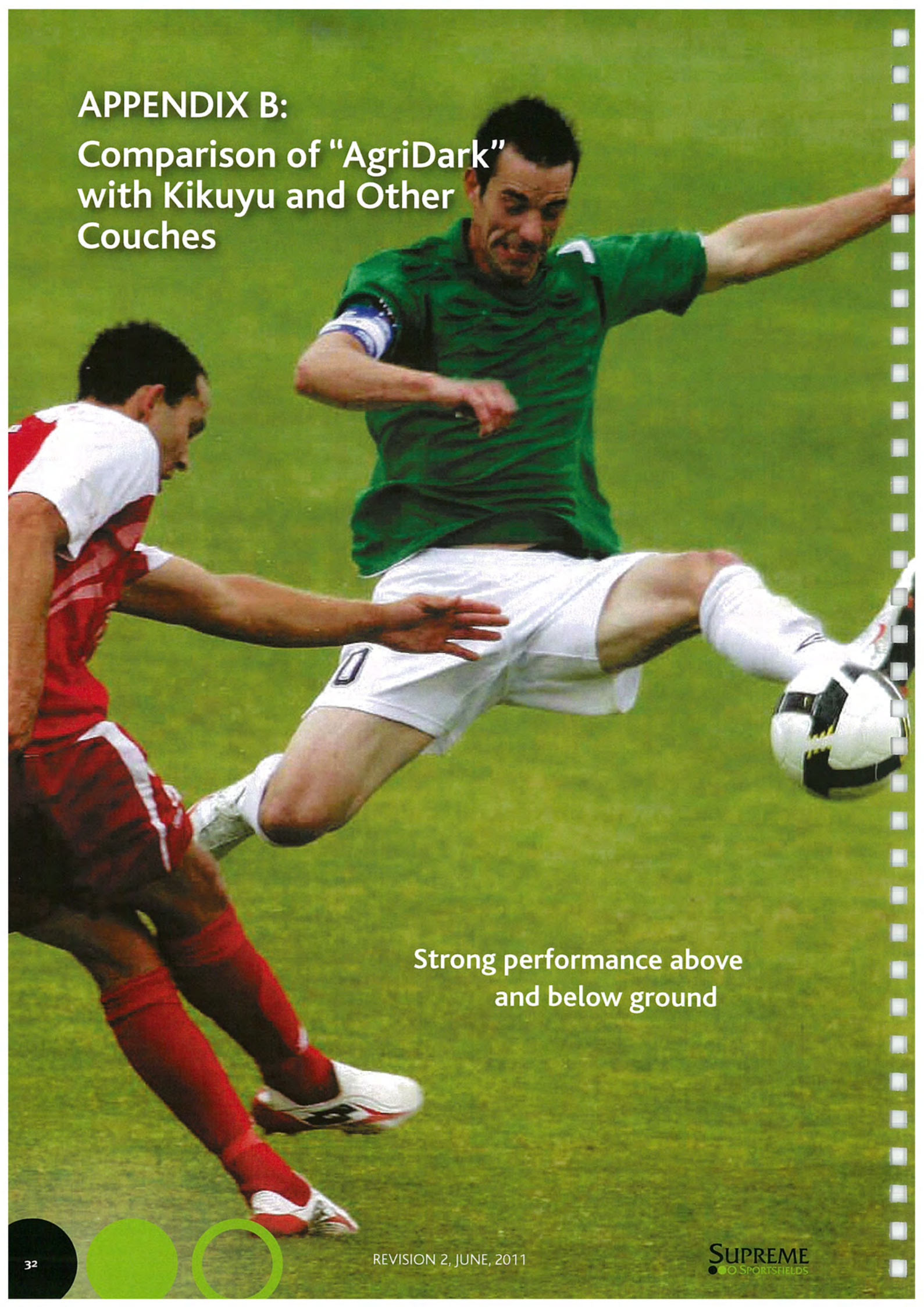


This field in Auckland is receiving ratings as one of, if not the best, field in New Zealand. Stunning to play on, stunning to look at and green all year round.



From surface stability for sure footedness, to comfort when coming into contact with the ground, this field has received consistently high praise from players.

See Appendix E for sporting code recommendations. End users of many different sports are now requesting *Supreme Sportsfields*. P 41-47

A full-page photograph of a soccer match. A player in a green jersey is captured mid-air, performing a bicycle kick with a soccer ball. He is being challenged by a player in a red jersey who is reaching out with his hand. The background is a green grass field.

APPENDIX B:
**Comparison of “AgriDark”
with Kikuyu and Other
Couches**

**Strong performance above
and below ground**

Couch vs Kikuyu – Spring Flush

Spring surface - Bruce Pulman Park (Papakura), October 2008



During spring, summer and autumn mowers work hard to keep Kikuyu under control. This is costly for councils. Kikuyu can clearly be seen here to flush in spring while the couch has slow but steady growth. "AgriDark" is mown 20% less than Kikuyu and Ryegrass in sports fields.



Kikuyu has large soft leaf and stolon. For a sports field surface this is undesirable. By pulling back leaf on the surface you can clearly see the ground which will become exposed once the soft leaf is worn.

"AgriDark" Couch vs Kikuyu – Root Matrix



Kikuyu sends out runners which send down roots at nodes. This is not as beneficial as couch because it does not stabilise the surface to the same degree. As the Kikuyu crosses over itself, it forms a weak surface structure which is spongy. Both Rugby Union and in particular Football players have stated they do not like playing on these fields.



"AgriDark" Couch has the best root matrix for sports fields. Under the surface this intense rhizome/root matrix binds together the sand or soil surface and can handle intense wear. The impressive rhizome network feeds the plant and helps to self-heal through rapid re-establishment. The fine white root hairs are very strong and bind the surface.



“AgriDark” Couch – Root Matrix

(warm season comparison)



“AgriDark” has a deep root matrix. When examining this sward of turf which has had all soil washed out note that the depth under the surface of intense root network is 40 to 80mm. That locks up the sports field surface.



“AgriDark” couch is on the left. Legend is in the middle and Kikuyu on the right. The finer the warm season grass the more beneficial for the sports field.

“AgriDark” Couch – Drought Tolerance

(Couch grass comparison)



3 Couches have been cut out of the ground, placed into trays in plastic lining and kept under simulated drought conditions



Legend Couch (2nd Generation)



Windsor Green Couch (1st Generation)



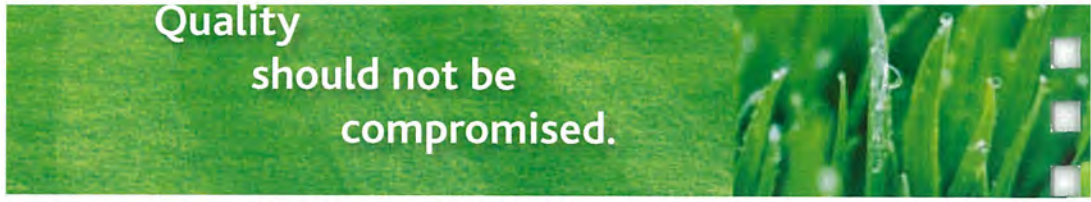
“AgriDark” Couch (3rd Generation)

While both first and second generation couches show severe stress, the third generation couch AgriDark survived better. More importantly, it bounced back quicker once watered. It is readily accepted by experts that Kikuyu requires more water than couch

A close-up photograph of vibrant green grass blades, likely sand carpet grass, with several clear water droplets clinging to their surfaces. The background is a soft, out-of-focus green, creating a sense of depth and freshness. The overall image has a slightly grainy texture, typical of a printed document.

APPENDIX C: Technical comparison of warm-season grass sandcarpet sports fields

Adapting
to Changes
in Climate and
Environmental Conditions

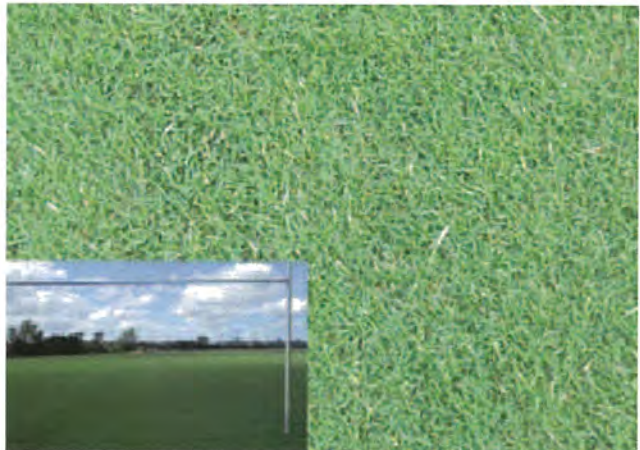


Couch (mono culture) - Sand Fields

Summer surface - Bruce Pulman Park - *Supreme Sportsfield*, March 2009



Field Profiling is a useful turf industry tool for examining the subsurface of a field which informs field experts of the condition of the plant and field profile. This example shows a healthy thatch at the top, clean healthy free draining sand layer and healthy plant root bonding into the peat base layer of the field.



This field corresponds to the field profile and demonstrates a healthy field which will deliver 15-20hrs of play and training both in winter and summer with a quality surface. This field has never been closed despite high use.

Winter surface - Seddon Fields (Auckland), August 2008



Seddon fields won the best sand soccer sports field competition in the Auckland region in 2005 one year after the establishment of this field in "AgriDark" couch. Notice the lack of root depth in the profile. Healthy fields should measure up to 18cm. While this has the correct grass variety and field type it is not performing up to its potential.



Despite years of poor management and incorrect maintenance programmes combined with extremely high wear in 2008 (110 senior teams and 130 junior teams using 4 fields for training and home games) only a small blow out developed.

Couch (mono culture) - Sand Fields

Summer surface - Lawson Park (Waitakere), March 2009

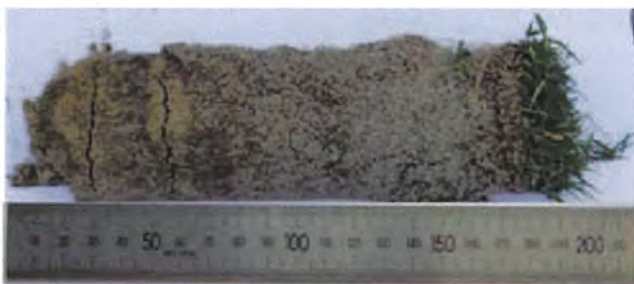


Lawson Park is an example of a good field type, good grass selection and good monitoring. However service providers are struggling to renovate this field properly and there is too much weed in the surface which in time will become a problem.



The surface has performed well in winter and summer. This park receives medium winter wear, has good grass cover and drainage. The drainage in this field has been compromised with soil-sod turf in the field, and clay around the Softball diamond.

Summer surface - Crum Park (Waitakere) *Supreme Sportsfield*, March 2009



This profile shows healthy sward, healthy thatch, and a stable profile with healthy roots. Profiles which hold together (sands at the depths shown) have excellent stability on the surface for players.



Crumb Park is a Supreme Sports Field. Rick de Vries the Chair of Bay Olympic football club spoke very highly of the field commenting that his Premier team loved training on it. The surface has performed well in winter and summer. This park receives medium winter wear, has good grass cover and drainage.

Kikuyu, Ryegrass and Poa annua - Sand fields

Summer surface - Seddon Fields (Auckland), March 2010



The No 4 ground at Seddon Fields is Kikuyu and from the moment it was grown in, it has been a complete failure. Requiring much more water and maintenance than the couch fields next to it, this field profile demonstrates the lack of field stability. Surface stability is poor.



Areas on the field are so bad they are described as a sand pit. The natural kikuyu cannot handle the winter wear and fails to recover for summer sports. This field is closed most of the time and is a complete frustration for the soccer club.

Couch (mono culture) - Sand Fields

Winter surface - Seddon Fields (Auckland), August 2009



Lack of investment into this sand carpet has led to an unstable surface and the field profile is unable to hold together.



Field 3 at Seddon Park is a Legend couch field which has, through high wear and poor management, experienced a continual decline in surface quality. Much time is spent on renovation and re-turfing.

Shear Vane Test



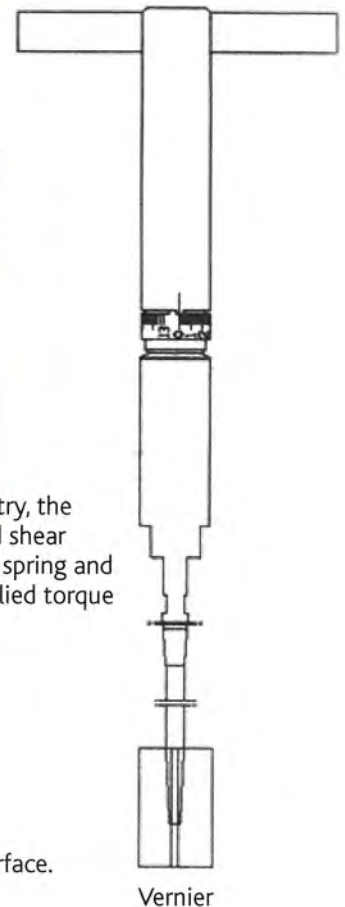
The structural strength of soils is a shear strength issue. Originally developed for the geotech industry, the Shear Vane tests soil structure. The Shear Vane testing has been designed to measure the undrained shear strength of cohesive mediums, soil and sand. It consists of a cylindrical body containing a torsional spring and 3 interchangeable vanes of different sizes. The value of this displacement is proportional to the applied torque undrained shear strength (C_u) values which are read from a scale etched on the vernier.

The classic formula has been to obtain C_u values from the torque (T):

$$\text{Formulas: } C_u = 6T \div [\pi d^2(d+3h)], C_u \times 10 = \text{kPa}$$

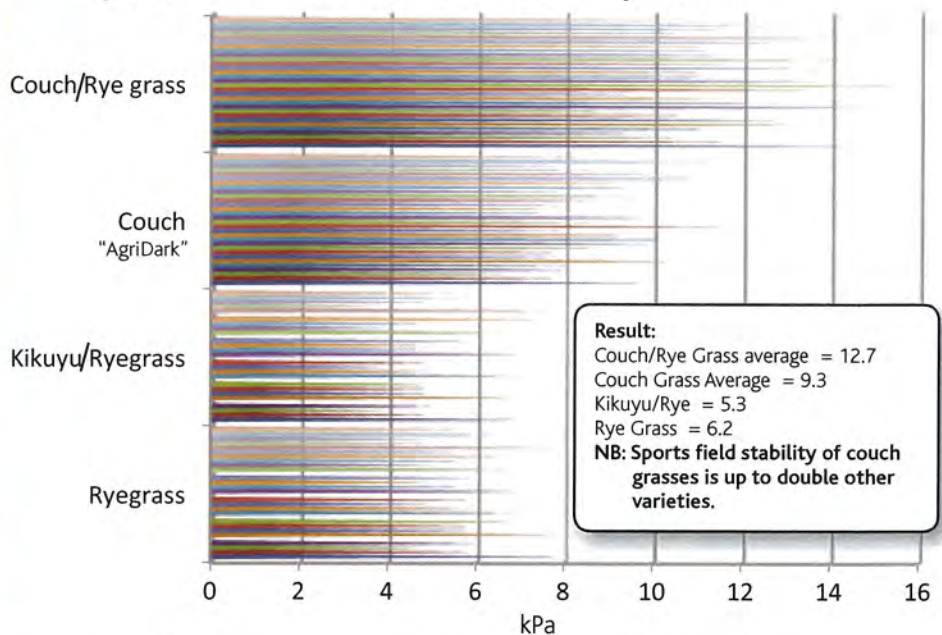
Variance Factors:

- 1) Soil moisture. Must be calculated.
- 2) Depth of test. Consistent.
- 3) Sampling. No less than 30 representative samples should be used from across the entire field surface.
- 4) Age of field, as organic matter build-up needs to be factored as well as grass root development.
- 6) Range 0-240 kPa.



Football field sampling

Sports Field Grass Share Vane Test Comparisons



Results: After testing numerous fields, couch grass and couch grass oversown with ryegrass provide the type of stability needed for winter sports in the Auckland region. This measurable degree of traction is strongest in fine couch varieties.

Recommendation: "AgriDark" Couch provides sure footing for sports players - eliminating scrum collapses in Rugby. It holds the surface of the sports field together during winter under high wear while providing superior and consistent bounce for a soccer ball. The resilience of the *Supreme Sportsfield* prevents injuries.

APPENDIX D:

Cost benefit analysis of differing sports field and grass types

Cost Benefit Analysis: Sports Field and Grass Types

Grass Type	Field Type	Hours of Play*	Quality of Playing Surface			Establishment Cost	Life Expectancy	Maintenance Cost Per Year	Cost Per Hour of Play**
			Winter	Summer	Overall				
Ryegrass	Soil or Clay	6	Poor	Poor	Poor	\$200,000	10 years	\$12,000	\$101.36
Kikuyu & Rye	Soil or Clay	8	Poor	Poor	Poor	\$200,000	10 years	\$12,000	\$73.62
Couch	Soil or Clay	12	Good	Good	Good	\$200,000	10 years	\$12,000	\$49.08
Ryegrass	Sand carpet	8	Average	Average	Average	\$250,000	15 years	\$15,000	\$59.09
Kikuyu & Rye	Sand carpet	10	Average	Average	Average	\$250,000	15 years	\$12,000	\$44.87
Couch	Sand carpet	20	Good	Excellent	Good +	\$250,000	15 years	\$12,000	\$22.44
Couch & Rye	Sand carpet	20	<i>Supreme</i>	<i>Supreme</i>	<i>Supreme</i>	\$250,000	15 years	\$15,000	\$28.52
-	Artificial	40	Good	Good	Good	\$1,500,000	15 years	\$15,000	\$67.91

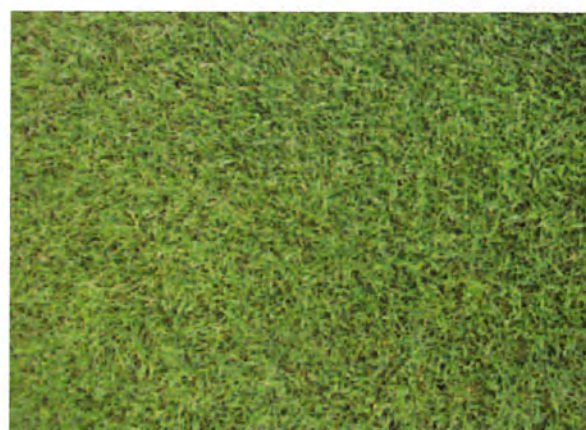
* Note 1: Hours of Play are expressed as average playing hours per week (there may be large variances Summer to Winter)

**Note 2: Cost per playing hour is based on a simple discounted cash-flow for the initial capital investment (5% interest) and includes annual maintenance costs

**Note 3: Cost per playing hour assumes good maintenance and management



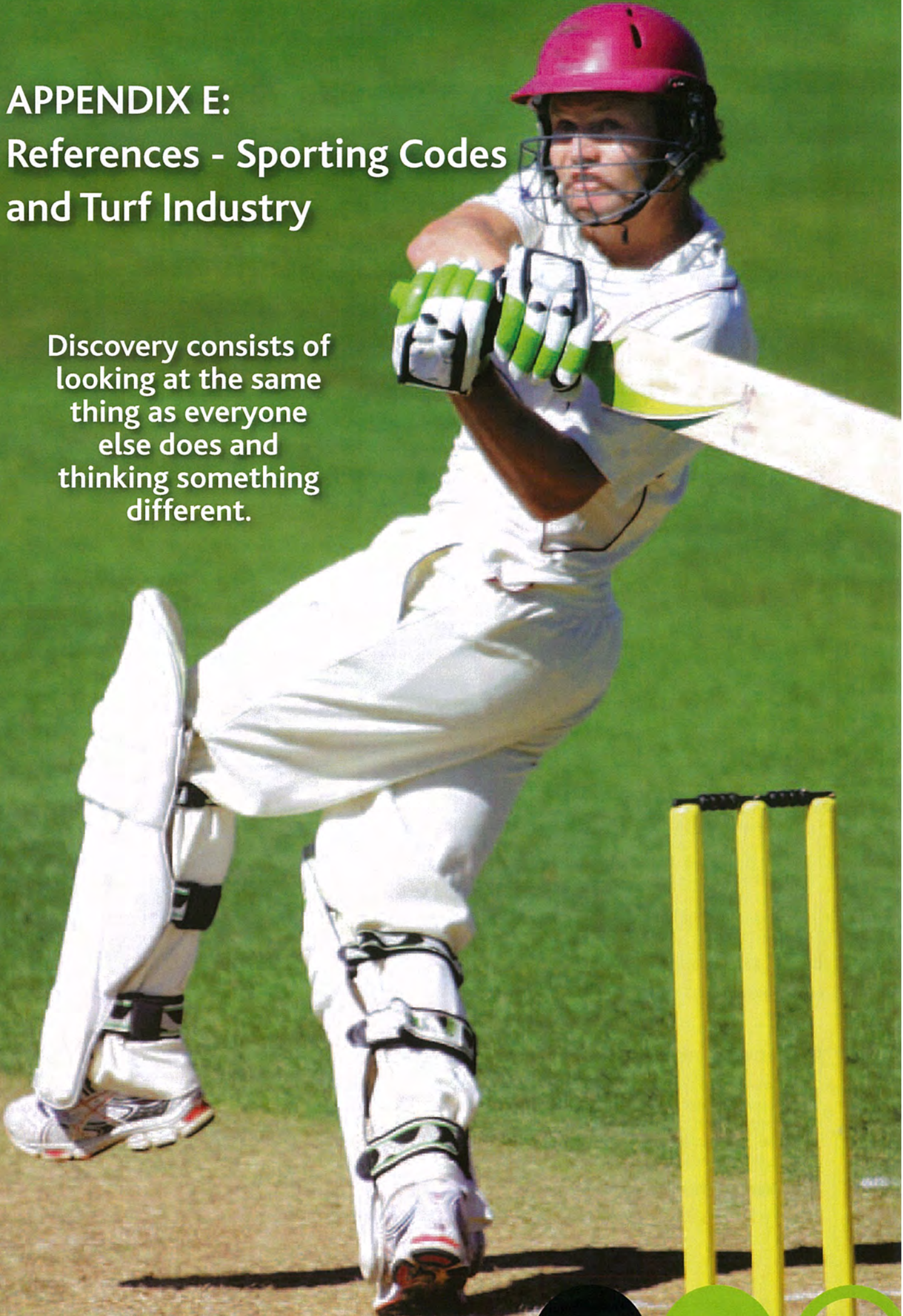
Ardmore Rugby Club No. 1 Field, Bruce Pulman Park, Papakura



Close-up photo of surface of a *Supreme Sportsfield*

APPENDIX E: References - Sporting Codes and Turf Industry

Discovery consists of
looking at the same
thing as everyone
else does and
thinking something
different.



i) Sporting code References: Rugby

Comments about Bruce Pulman Park (*Supreme Sportsfields*)

"The quality of the playing surface at Bruce Pulman Park is second to none. From a rugby performance perspective this is the type of track that players just love to play and train on. From a sports administration perspective we should be striving to ensure that our players get to play on the best playing surfaces possible and without doubt this is the surface we should be aiming for across all parks in the Auckland Region."

Matt McHardy – Auckland Rugby Union Club Rugby Manager.

ARU Ph: (09) 815-4759

Mob: 0274-818-151

email: matt.mchardy@aucklandrugby.co.nz

Comments about Bruce Pulman Park (*Supreme Sportsfields*)

"I cannot speak highly enough about the "AgriDark" couch rugby fields we play on at Bruce Pulman Park. Every single team that plays against our teams makes reference to the "high quality fields" in their speeches first. For training and playing games I believe they are the best in Auckland. Visiting UK rugby league teams have told me they are better than anything they have in UK. On our No 1 field the day after 3 or 4 games have been played, you can't see any wear, which is green all year round as we over sow it with Ryegrass. Our other fields brown off between July and September after receiving their first frost for the year. However the integrity of the sport field surface is like a bowling green carpet, just great to play on. We don't get injuries you get on other fields because of the combination of sand carpet and tight dense grass cover and they give sure footing to play sports on. Our games are high scoring and fast with no scrum collapses I hope those in charge get some uniformity across Auckland with more of these fields, it would be great for sport. Please contact me if you have any inquires."

Rob Burton Ardmore Club President.

Mob: 027 292 5071

email: r.burton@xtra.co.nz

Comments about FMG Stadium (No2. Field)

"I allocate all the grounds in the Manawatu and work closely with people to make sure they are in the best condition they can be. We have found the "AgriDark" field to be a fantastic field to play on. It does not cut up as much as the ryegrass fields and the feedback from players is that it provides good traction letting them turn, pivot and step without losing their footing. This field is particularly good for rugby as scrums don't lose their footing, it's really secure. Not only do I get feed-back from players and coaches, I am a referee and get to see it first hand as I run around on it with them and it performs really well. We look forward to seeing more of these fields in the Manawatu that can handle the wet winters."

Chris Ricketts - Community Rugby Manager

MRU Office: 64 6 357 2633

Mobile: 021 999 404

e-mail: chris.ricketts@manawaturugby.co.nz

Comments about Bruce Pulman Park (*Supreme Sportsfields*)

"The Steelers used the sand carpet fields with "AgriDark" couch at Bruce Pulman Park fields as a home ground in 2008 and found the fields in great condition, never shut through bad weather, delivered a top level of performance for play and training with which we could hammer for up to 20 hrs per week during winter, they have a tight knit surface which lets the players pivot and explode with confidence, so they can reach their potential. I cannot speak highly enough about the grounds and hope that more of this type of ground is provide in Auckland to play on."

Adam Newman- Steelers Team Manager

CMRU: +64 237 0033

Mobile: +64 21 392 259

e-mail: admin@steelers.co.nz



ii) Letter of recommendation from Rugby Union: Comments about *Supreme Sportsfields*, Bruce Pulman Park

From: Matt McHardy
Sent: Thursday, August 06, 2009 4:01 PM
To: 'Peter Harding'
Subject: Sports fields in Manukau City

Hi Peter

It is my understanding that you caught up with Leigh Hunt from Cervadon Ltd at the New Zealand turf conference in Auckland discussing options of grass surfaces for sports fields in Manukau. Leigh has asked me to email you my view on sport fields and potential grasses for cover in the Auckland area.

As far as Auckland Rugby Union is concerned we would like the council to provide the best possible surface for the players to play sport on and develop their full potential as a player through practice. To achieve this we believe that the best surface should have:

1. Good drainage. Roots of any grass will not grow if a plant is sitting in water and players don't enjoy playing in mud or slipping over because of surface water.
2. Good grass cover. Full cover on the surface helps keep players and the surface clean, including the ball. A healthy surface also indicates good structure underneath which in turn helps the stability for the player. If you examine the surface of the fields during the rugby season at say Bruce Pulman Park and compare them to other fields in the Auckland area you will notice they do not cut up as much and have full cover. There are no blow outs which you do get in ryegrass fields from players boots. From my observation couch grass seems to provide the best cover.
3. Good root structure. Grasses such as rye do not cater adequately to the demands of rugby. The root structure of couch grass provides the most stable surface with its interlocking root system. Ryegrass on the other hand does not provide the same sure footing for rugby players.
4. Hard Wear. With increasing population and the need for more play on each field, wear has become a critical factor and a major risk for growing the game. Grounds are used extensively in summer and winter and from my observation couch wears better than ryegrass.

The only draw-back to using couch grass in winter is the look when it browns off in June, July, and August. This has nothing to do with the quality of the playing surface. This can be overcome by sowing a cool season grass such as rye, negating the brown colour completely but retaining the superior cover on top and sub-surface.

I have also received a great deal of feedback from teams who have played on Kykuyu surfaces - they do not seem to enjoy the spongy surface it offers. At the start of the season when the grass is longer sprigs from boots tend to catch, while it also seems to sap the energy from players running across it. It seems to leave ropy tentacles lying on the surface exposing the ground beneath and does not supply the same sub surface strength you get with other couches. I am not sure why that is you may need to ask the experts.

When considering the quality of the couch grass surface I understand in Australia (of which trends NZ seems eventually to follow often some five years behind) couch grasses are now (almost completely) the only grass planted into sports fields including the cooler states like Victoria. From all accounts this is largely due to couch grass requiring a great deal less water than cool season grasses like Rye which have beneficial saving when producing good surfaces for summer sports. Therefore for multi-use sports fields it would seem couch grass would be a good option for winter and summer sports. (Also rugby kicking off earlier these days)

When considering options of grass surfaces for sports fields in Manukau City district, the Auckland Rugby Union would like to promote the use of couch grass as a preferred type and what we want for our players both from a player-performance perspective and for the surface to be able to support more usage and recover quicker.

Please feel free to use my comments in pushing forward to improving the quality of our sports fields and take on board our positive suggestions as end users.

Regards,

Matt McHardy

Mob: 0274-818-151

email: matt.mchardy@aucklandrugby.co.nz

iii) Email sent to Jono Naylor Mayor of PN, by Chris Ricketts Community Rugby Manager, Manawatu.

Comments about soil "AgriDark" sports field (FMG field No.2) *Supreme Sportsfield*

Hi Jono,

I had hoped to be at your recent meeting with Leigh Hunt from Cervadon regarding the "AgriDark" couch-based turf, but had another commitment. I want to give you my thoughts in support of his proposal to utilise "AgriDark" on PNCC grounds.

We have the couch-base on field 2 here at Arena. I have observed many games and also refereed on this pitch and it is by far the best surface we currently have in the Manawatu - both from a player-performance perspective and for the surface to be able to support more usage and recover quicker.

I would like to see the surface used on the main oval at FMG Stadium. This will provide a better playing surface for club and representative footy and enable us to play more games on our premier ground. The advantage to the players (particularly in Air New Zealand Cup games and the upcoming RWC 2011 games) will be that we are providing them the best possible surface performance wise for these showcase events.

Another ground that would benefit immensely is Ongley Park. We now have fantastic changing facilities down there and a surface to compliment these would enable us to utilise these grounds for Senior 1 club footy and higher levels of the game. An issue currently is that this is a multi-purpose ground with extensive usage during the winter months by junior, schools and senior rugby. In winter we are subject to ground closure, affecting dozens of rugby games, when there is a risk of the ground cutting up, due to the PNCC's need to protect the surface for cricket in the summer.

I hope you find my comments useful in any push to improve the quality of our sports fields here in the Manawatu.

Regards,

Chris Ricketts - Community Rugby Manager

MRU Office: 64 6 357 2633

Mobile: 021 999 404

Facsimile: 64 6 354 1670

e-mail: chris.ricketts@manawaturugby.co.nz

MANAWATU RUGBY FOOTBALL UNION INC.



iv) Sporting code References: Rugby League

Comments about Ardmore (field No.1), Bruce Pulman Park *Supreme Sportsfield*

Quote from Craig Pascoe:

"... as good as Mt Smart # 1 field"

The CM Maori League had a Penrith age group under 18's as guests and their feedback on the facilities at Bruce Pulman Park was they were to NSW regional and NRL standard. Better than sports grounds they normally play their games on. Craig Pascoe refereed some of the games on Saturday.

Craig Pascoe [Auckland # 1 or # 2] referee.

Comments about Ardmore, Bruce Pulman Park *Supreme Sportsfield*

Quote from Trevor Clarke:

"The "AgriDark" fields at Bruce Pulman Park are the best in the country. From a training perspective this surface is what players and Coaches want. It enables the development of superior skills with intense practises which do not result in injuries you can get on standard fields. From a playing perspective the enjoyment and skill development in players (often unmeasurable) is considerable higher because of the excellent surface. Players push to line brake rather than pass or kick the ball. From a health perspective players experience less injuries having trained on a good surface to go and then play on a good surface. When players train on a soft soil or clay surface and then play of good firm grounds they develop lower back and hamstring injuries. Training for skill development and conditioning on superior sports fields will lead to winning team performances. I would encourage all responsible for the building of sports grounds in New Zealand to reproduce the excellence which I have experience first-hand at Bruce Pulman Park."

Trevor Clarke

Moblie : 021 827 127

Trevor has been involved in rugby league for the past 25 years as a player, trainer, coach, manager, educator. As Football Manager of the Auckland Warriors he was responsible for all organisational issues with the team, including travel, welfare, training schedules, sponsorship obligations, and discipline as well as being primarily responsible for their physical preparation.

Elevated to Assistant Coach during the 2000 season, whilst he was also Head Strength & Conditioning Coach during his 3 years with the club. Trevor went on to coach two years in the Bartercard Cup with Manurewa Marlins before moving to Australia where he coached two years in the Jim Beam Cup for Windsor Wolves & Erina Eagles.

Trevor has spent two years as Strength & Conditioning Coach with North Harbour Rugby NPC team in NZ (when they were holders of Ranfurly Shield) with responsibility for senior rep and elite Academy teams.

v) Cricket

Comments about Cobham Oval (Supreme Sportsfields)

"Great colour / Hard wearing / Cheap upkeep / Ball runs on well / Great to field on / Good value for shots / Players not tired / Looks great / Players love it"

Gary Bell - CEO Northland Cricket: Cobham Oval

Ph: 09 438 2400 Mobile: 021 438 918

Comments about Cobham Oval (Supreme Sportsfields)

"Great to slide in on without injuries / Money for jam when batting / Ball flows nicely / Can't speak highly enough about "AgriDark" outfield"

Joseph Yovich - North Knights: 1st class cricket

Ph: 07 839 3783

Comments about Cobham Oval (Supreme Sportsfields)

"Facilities at Cobham Oval are world class with a superb cricket ground and wicket".

Justin Vaughan - CEO NZ Cricket

Ph: 03 366 2964

Comments about Blake Park, Tauranga (Supreme Sportsfields)

"Best out field in NZ / Cheap upkeep / Strips up well for Sky / Dark green colour / Tight surface great for fielding / Ball runs well"

Kelvin Jones – Operations Manager BOP Cricket: Blake Park

Ph: 07 575 9120 Mobile: 021 508 837

Comments about Supreme Sportsfields

"Last year I was the turf manager for NZ cricket and it is my belief that "AgriDark" is the best grass for out fields for cricket. Now I look after one of the best facilities for cricket in NZ at Blake Park, a 1st class cricket oval at the Mount in Tauranga. "AgriDark" allows players to develop skills to a higher level by batsman reducing false shot making and fields attacking the ball aggressively with no concern for injuries".

Jared Carter - Blake Park BOP

Mobile: 021 362 758 Email: jcarter@nzcricket.org.nz

Comments about Blake Park, Tauranga (Supreme Sportsfields)

"Have played the last 2 weeks at the Bay Oval in Mount Maunganui called Blake Park, and have found the "AgriDark" outfield to be of the best quality I have played on in NZ".

Campbell Wilson - 1st class player BOP

Mobile: 027 203 7601 Email: campbell.wilson@lionfoundation.org.nz



vi) Football

Comments about "AgriDark" on Seddon Fields (field No.1)

Quote from Chris Judd:

"AgriDark is a fine couch grass on fields one and two at Seddon fields where I play soccer. It is by far the best grass to play on providing the ultimate surface for soccer, the ball rolls true and the surface holds together even after 25 hours of play per week. From a goalkeepers perspective I need to be sure footed and AgriDark provides that."

Chris Judd – Western Springs Soccer Team

Mob: 027 302 9405 email: cjleigh@vodafone.co.nz

Comments about Crum Park (*Supreme Sportsfields*)

Quote from Rick de Vries:

"I am happy to say we are delighted with the redevelopment by Waitakere council of the No 2 field at Crum Park. I can highly recommend the couch grass on Crum no 2 field as a surface to train and play soccer on. Our premier team trained on this field and came second in the Chatham Cup this year. They boys are delighted with the fine tight surface of the couch grass which allows control on the ball at the moment it is needed. When comparing this to the No 1 field which is Kikuyu, which is not a good grass for soccer players, control is more difficult and it is too soft and spongy while not handling the hard wear soccer players deliver."

Rick de Vries – Chair Person Bay Olympic Soccer Club.

Phone: 09 817 4863 Mobile: 0274 374 352 e-mail: rickdevries@slingshot.co.nz

vii) Lacrosse

Comments about Ardmore Club (field No. 2) (*Supreme Sportsfields*)

Quote from Mark Freemon:

"I have been involved with La Crosse NZ for many years and have played around the world on many different fields. The "AgriDark" No 2 field at Bruce Pulman Park is the best I have seen and or played on in the world. Quality fields like this are important to sport on many levels. Please contact me as I would like to encourage councils to build and maintain fields to a level which encourage participation in sport and protects us from injuries you receive when playing on standard grounds".

Mark Freemon – New Zealand Lacrosse

Mobile: 027 452 9695 Email: freemon.nzla@xtra.co.nz

Recommended Turf Industry contacts:

viii) SPORTS FIELD CONSULTANT

Mark Delay - Sports Field Designer

Mobile: 021 857 009 Email: markd@ssc.net.nz

Mark has more experience with the establishment of couch grass than anyone in NZ. He also is very good at the management and maintenance of the grass on sports fields and the establishment of couch fields. He has experience with all the varieties on the market. He has identified through years of examination AgriDark to be the superior grass for sports fields.

Sonya Harrison – Former Local Government Officer

Mobile: 021 684 764 Email: s.harrison@harrisingrierson.com

I strongly recommend AgriDark as the best grass for sports fields in the Auckland region. It provides more playing and training hours when compared to other natural grasses on the market. Sports people prefer to play on it.

Sonya worked for Waitakere District Council and was responsible for the operations of all sports fields in Waitakere and is now doing Capex development work for Auckland Council. She currently works for Harrison Grierson.

ix) CITY SERVICES PROVIDERS

Warren Man – City Services Provider

Mobile: 027 215 2240 Email: warren.mann@citycare.co.nz

Warren works for City Care in Rodney. The Rodney district council has more couch sports fields than any other council in NZ. Warren is very good at looking after couch fields and previously advocated Legend, but now believes "AgriDark" is the best grass on the market.

Karen Davies – City Services Provider

Ph: 09 367 2400

Karen works for City Parks Services. Karen is the Quality Field Auditor for City Park Services and takes many photos of the fields under their care. Karen has no doubt in her mind that when "AgriDark" couch is maintained well it is the best grass for sports fields in the Auckland region.

Jon Bonner, City Care Divisional Parks Bay of Plenty

Mobile: 0061 4 3480 3921 Email: jon.bonner@stadiums.qld.gov.au

"My experience with AgriDark is that it has grown in well. Quick to establish, fine texture, dark green appearance, aesthetically appealing to players. Easy grass to manage through the transitional period in sports from summer to winter codes."

x) LOCAL GOVERNMENT SPORTS PARKS OFFICERS

Chris Burgess – Local Government Officer

Mobile: 021 273 0510 Email: chris.burgess@aucklandcouncil.govt.nz

Chris works for Rodney District council and is responsible for the operations of all sports fields. He has every type of couch sports field available and many years of experience. After years of trialling, Chris believes that couch grass ("AgriDark") is the best option.



Chris Howell – Local Government Officer

Mobile: 027 683 7142 Email: chris.howell@tcdc.govt.nz

Chris has experience with "AgriDark" in the Thames Coromandel region from cricket fields to airfields to amenity turf. Regarding sports fields Chris believes "AgriDark" is a great choice because it hold together in winter and delivers a great grass cover in Summer. Drought tolerant and hard wearing.

xi) Contractors

Doug Strachan, Contractor

"I've had 20 years in the turf industry, mostly with sports fields. I became interested in AgriDark because the cost of irrigation is so high and you don't need to irrigate with AgriDark couch. AgriDark is the top couch on the market with a superior speed of establishment and great self repairing qualities. Aesthetic qualities are great, dark green, fine leaf."

Mike Hutchens, Contractor

"I've had 30 years in the industry of growing grass. AgriDark has a nice dark texture and is a strong grass. It is drought tolerant and takes off early in the spring. You would be hard pressed to find a better couch grass. It is easy to handle and manage."

Phil Duthie, Contractor

I am fully qualified in sports turf management and back that up with 21 years experience. AgriDark is fast to establish and grows on well. AgriDark grows well into the winter and exits dormancy nice and early. Dark green colour and fine textured blade. Very impressed with hardiness and quick recovery times. Natural stability remains strong even when grown in coarse sands.





APPENDIX F:
NZSTI Turf
Management
Journal Extracts

The past does not define you,
the present does.

APPENDIX F: NZSTI Turf Management Journal extracts

FEATURE ARTICLES

Denoted from New Zealand Turf Management Journal May 2006



AUCKLAND REGION'S BEST SPORTS FIELD COMPETITION — WINTER 2005

Since 2001 the Sports Field Forum NZ Inc. has held a competition in the Auckland region to acknowledge who provided the best winter sports field. This article announces the results of the judging from the 2005 competition.



Sports Field Forum NZ Inc.
Auckland Region
NZSTI
Turf Clean NZ
Auckland Region

INTRODUCTION

Since 2001 the Sports Field Forum NZ Inc. has held a competition in the Auckland region to acknowledge who provided the best winter sports field. This article announces the results of the judging from the 2005 competition, as well as discusses the averages for maintenance and usage.

Four Auckland Councils (Rodney District, North Shore City, Auckland City and Manukau City) participated in the 2005 competition. A total of 16 sports fields were entered into four categories – those being sand/sooccer, sand/rugby, soil/sooccer and soil/rugby. The four categories were based on the main winter sport played on the field (soccer vs. rugby) and the profile type (soil vs. sand).

AUDITING

A thorough auditing process was conducted over two different dates (May and August), whereby members of the auditing team visited every entry on the same day. A total of 14 auditors comprising of staff from each of the participating councils, contracting firms, turf consultants and NZSTI turf Institute agronomists participated.

ASSESSMENT

The fields were assessed for a variety of different criteria, including:

Presentation Quality

- Visibility of line markings
- Quality of mowing
- Turfgrass colour/uniformity of appearance
- Condition of the goal posts

Structural Quality

- Presence of erosion zones
- Turf density
- Grass weed contamination
- Broadleaf weed contamination

An overall assessment on a scale of 1 (poor) – 10 (excellent) was also given to each field as an indicator to the judging panel of the auditor's overall impression of the standard of each field.

METHOD

The assessment document, annual costs of maintaining the fields, inputs for maintaining the fields and booked usage records on the fields were all taken into consideration as each category winner and ultimately the overall winner was decided.

Each portion of the overall score was weighted as follows:

Audit One	25%
Audit Two	25
Usage	25%
Maintenance inputs	12.5%
Cost of maintenance	12.5%
	100%

The presence of erosion zones on the field carried a heavier weight effect on how sport is played on a field. Quality of mowing was a criterion to a good sports field and was also consequently given a

The usage assessment was based on the booking information supplied to the participating councils. This information was categorized into the following categories:

Senior Competition	Junior Competition
Senior Schools	Junior Schools
Senior Training	Junior Training
Senior Social	Junior Social

Junior competition was weighted at half the score of senior competition, the damage caused by juniors arguably being half that of senior players.



Above: The auditing team: Ali Clegg, Manukau City Council; Warwick Sisson, Recreational Services; Craig Dennis, Rodney District Council; Darren Kalka, Auckland City Council; Mike Gallagher, Auckland City Council; Shane Maddren, Manukau City Council; Jeremy Hill, Excell Corp; Richard Gibbs, Sports Surface Design & Management; Spencer Myer, NZSTI; Richard Ralovich, Manukau City Council. Photo taken by Robert Finlay, Manukau City Council, also part of the auditing team.

DATA MANIPULATION

Hours of use

Field usage was derived from the booked hours of use per field and are taken on a weekly basis. The results illustrate that sand is more heavily used than soil, but not as dramatic as the results reported in 2001.

- Soil fields – average 5.5 hrs/week
- Sand fields – average 9.5 hrs/week

Expenditure for both maintenance and renovation were calculated on a weekly basis (expenditure/week).

Cost per hours of use

Over the winter period 'expenditure per week' divided by 'use per week' provides a useful indication of cost per hour of use.

Results: Below is a summary of the results for all of the sports fields that participated

Category	Venue	Presentation	Usage/week (hours)	Cost/hours of use
Rugby - Soil	Ti Haka League No.1	64	64	\$20.76
	Avenley Reserve No.2	65	65	\$28.17
	St. Wollington Memorial No.6	79	79	\$30.61
	Teitokuhi United Rugby Club No.4	49	40	
Rugby - Sand	Best Hartam Reserve No.1	78	78	\$20.02
	Shore Road Reserve No.1	85	85	\$81.29
	Clare Bay Reserve No.2	70	70	\$23.85
	Freyburg Park No.1	83	83	\$196.89
Soccer - Soil	Riverview Soccer No.2	70	70	\$18.94
	Princes Bay Reserve No.7	62	62	\$26.84
	Waikanae Park No.1	70	70	\$17.38
Soccer - Sand	Seddon Fields No.1	69	69	\$14.82
	Keith Bay Park No.3	63	63	\$8.99
	Riverview Soccer No.1	80	80	\$120.64
	South Harbour No.4	91	91	\$109.56
	Stamrose Bay No.2	70	70	

The winners of the 2005 Best Sports Field Competition (sponsored by Turf Clean NZ) were as follows:

Category	Venue	Owner	Contractor
Rugby - Soil (Sponsored by PGG Wrightson Turf)	Ti Haka League No.1	Manukau City Council	Excell Corporation
Rugby - Sand (Sponsored by NZSTI)	Best Hartam Reserve No.1	Auckland City Council	Recreational services
Soccer - Soil (Sponsored by Turf Clean NZ)	Seddon Fields No.1	Auckland City Council	City Parks Services
Soccer - Sand (Sponsored by NZSTI)	Riverview Soccer No.2	Auckland City Council	City Parks Services

Seddon Fields No 1 was established in January 2004 in AgriDark couch winning the best soccer — sand field winter sports competition 2005

FEATURE ARTICLES

Denoted from New Zealand Turf Management Journal May 2002

AUCKLAND REGION'S BEST SPORTS FIELD COMPETITION — WINTER 2001

Robert Findlay · David Wells · Manukau City Council · NZ Sports Turf Institute Auckland

There is nothing like a bit of competition to lift standards. In 2001 the Auckland Sportsfield Managers Forum decided to set up a process to find the best winter sports fields in the Auckland region. Robert Findlay and David Wells report.



Six Auckland Councils - Franklin District, Manukau City, Auckland City, Waitakere City, North Shore City and Rodney District - participated in a competition to find the regions best sports fields for the winter of 2001. Collectively the councils entered a total of 28 fields. The competition separated soil and sand fields by sports codes - soccer, rugby union and rugby league; a total of six divisions.

Auditors were asked to evaluate how well the needs of the sports codes/players were being met, and in doing so find the 'best' field - soil or sand - for each of the major codes. The competition provided an opportunity to raise the profile of those involved in the sports turf industry, identifying those managers within the councils assets - divisions and the contractors associated with the best fields.

METHOD

Representatives from the six councils, associated contractors and New Zealand Sports Turf Institute made up the audit team. Three audits were conducted; before, during and after the winter season. The audits considered each field for function and presentation from the player's perspective.

Performance Criteria:

- Surface smoothness, scale 1-10 (10 = best)
- Surface stability, scale 1-10 (10 = best)
- Turf density, score 0-100%
- Weed content, score 0-100%
- Bare ground, score 0-100%
- Field presentation (e.g. Goals, line marking, safety issues etc) scale 1-10 (10 = best)

Agronomic aspects such as drainage, plant health, root depth were not specifically considered. These aspects were picked up indirectly by the performance criteria evaluated.

A positive spin off of the evaluation of fields within six council districts on the same day was the opportunity to travel and discuss the management of the venues with peers.

RESULTS

The final score was made up (two components, 50% came from the audit total, the remaining 50% is based upon the level of use (hrs/week) and expenditure (\$/wk).

Audit total (smoothness + stability + presentation + (turf cover % ÷ 10) - (bare ground % ÷ 10) - (weed % ÷ 10)) has a maximum of 40 points. The addition of the sub-totals for pre, mid and season end gave a possible total of 120.

The average audit total for 14 soil fields was 76.33 (64%). Average audit total 13 sand fields was 96.6 (81%). Notably the sand fields were considered on average to be 17% better on performance standards.

We congratulate all winners, both councils and contractors. The results indicate that there is a high level of expertise within the region. The best fields, soil and sand, for each of the three major sports codes were:

CONCLUSION

It would appear that sand fields offer the following advantages:

- Sand fields offer better facility utilization where one sand field is the equivalent of two - three soil fields. Sand fields could be of tremendous value where sports field availability is at a premium, or where reducing the number of parks is of interest as a cost saving measure. Reducing park numbers will achieve cost savings in areas such as surrounds maintenance, toilet/changing rooms, parking requirements etc. This can be balanced against the extra field maintenance costs.
- Sand fields offer less field closure and therefore greater player satisfaction.
- Sand fields offer better performance. In spite of the additional use sand fields on average rated 17 % better than soil fields.

Warren Freer Park is an established AgriDark field, winning Auckland regional best rugby sand field winter sports competition 2001.



Note: Problems with drainage on soil fields that result in field closures.

Category	Venue	Owner	Contractor
Rugby Union			
Soil field	Avondale Racing Club No. 2	Auckland City	City Park Services
Sand field	Warren Freer Park	Auckland City	City Park Services
Soccer			
Soil field	Bledisloe No. 1	Franklin District	Serco Infrastructure
Sand field	James Watson No. 1	Manukau City	Excell Corporation
Rugby League			
Soil field	Point England No. 1	Auckland City	Recreational Turf
Sand field	Ellerslie Domain No. 1 and Stanmore Bay No. 2	Auckland City Rodney District	Recreational Turf Works Infrastructure

Far Top:
Robert Findlay, David Wells

Middle:
Representatives of the Audit Team

Above:
Auditors scoring Worksworth Showgrounds No. 1.



APPENDIX G: Examples of poor maintenance and asset management

“Champions aren’t made in
the Gym. Champions are made
from something they have
deep inside of them...
a desire, a dream, a vision.”
Muhammed Ali



APPENDIX G: Examples of poor maintenance & management

Couch mismanagement

Spring surface – Seddon Fields #1 (Auckland)



Many service providers in Auckland do not understand how to look after couch and apply wrong chemicals at the wrong time of the year effectively burning off healthy thatch that should be forming the base for summer sport.



This method of renovation caused field closure and kills live plant matter. The organic dead material should not be left to rot into the sand profile because it destroys the free draining properties of the sand carpet.

Sand carpet– Mismanagement

Spring surface – Seddon Fields #3 and #4 (Auckland)



Field #3 is a "Legend" couch sand carpet and has blown out under high wear. As a renovation, soil sod turf has been placed into the sand carpet. This has compromised the profile and prevents proper drainage, causing water to pool on the surface.



Field #4 is a Kikuyu and Ryegrass sand carpet. This field has blown out in the central corridor and has been renovated with soil sod turf. This has compromised the profile and prevents proper drainage, causing water to pool on the surface.



Sand carpet mismanagement

The two photographs below were taken within minutes of each other. They show two different sand carpet fields at Seddon Fields during the same football tournament.

Spring surface – Seddon Fields (Auckland), September 2010



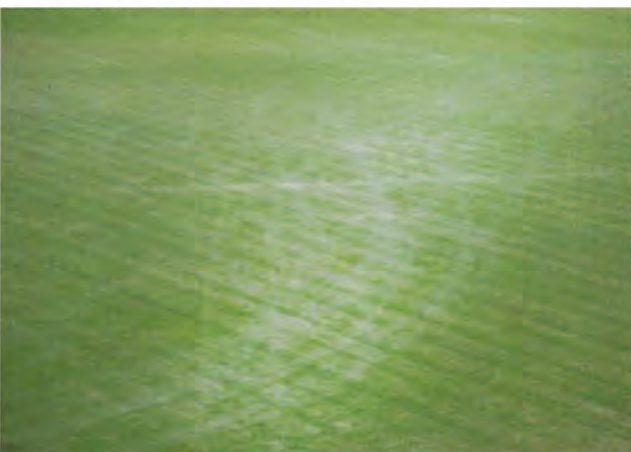
This photo is of Field # 1 at Seddon Park. The field is sown with "AgriDark" couch. Compared to the photograph on the right, this field has suffered only one blow out and is draining freely in the rain.



This photo is of Field # 3 at Seddon Park. The field is sown with "Legend" couch. The field has suffered multiple blow outs and the subsequent renovations with soil sod turf have altered the profile and is causing the field to hold water.

Sand carpet– Mismanagement

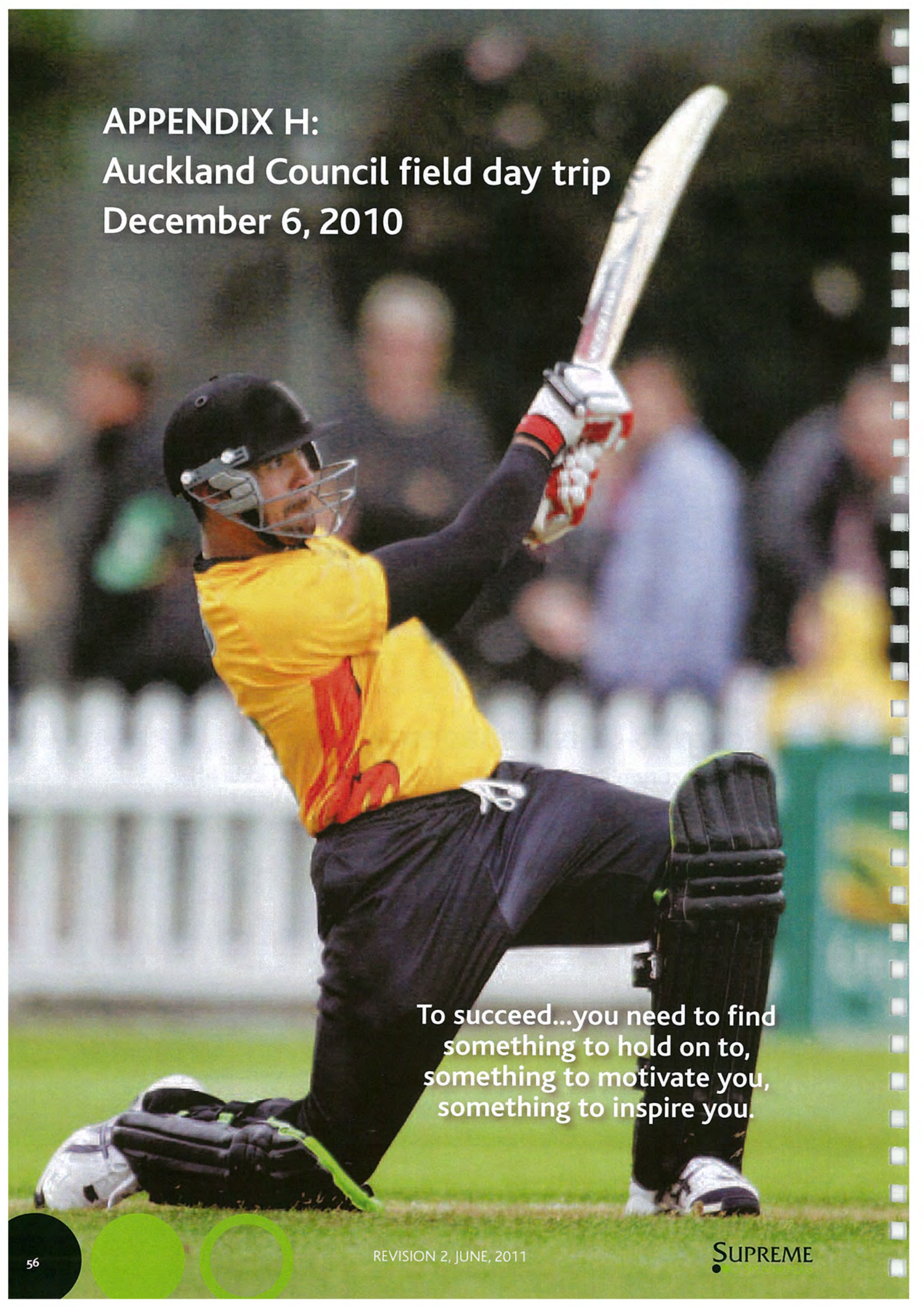
Spring surface – Crum Park Field #2 and Glenora Park (Auckland)



No. 2 Field, Crum Park: Renovation machinery has driven across the field from the car park to access the number 3 field for sand top-dressing. Service providers should take more care as this will compromise the integrity of the sand carpet, causing problems with future grass growth and drainage due to compaction. This won't be noticed immediately, but will end up costing Auckland council through unnecessary repairs.



Glenora Park: Poor sports field maintenance has led to sprinkler heads becoming covered and dysfunctional. Rather than irrigating the sports field this sprinkler head wells up water from the ground encouraging the growth of Poa Annua.



**APPENDIX H:
Auckland Council field day trip
December 6, 2010**

**To succeed...you need to find
something to hold on to,
something to motivate you,
something to inspire you.**

APPENDIX H: Auckland Council in the field (sand carpets)

Seddon Fields : Varieties - "AgriDark", Legend, Kikuyu Ryegrass



Result: **Field Closed**

At Seddon Fields, 3 warm-season grasses have been trialed over many years.

- "AgriDark" Fields 1 & 2: performed best, handled most wear, one blowout. Receives poor maintenance.
- Legend Field 3: performed second-best. Numerous blowouts. Surface compromised with soil sod turf.
- Kikuyu Field 4: closed for renovation, needs more water and work, poor sports surface to play on.

Lawson Park : Varieties - "AgriDark", Ryegrass



Result:

- "AgriDark" Field 1: In reasonable condition. Has the components of a *Supreme Sportsfield*, but is not being managed properly.
- Too many weeds.
- Field surface compromised with soil sod turf and softball diamond clay.
- Ryegrass Field 2: Extremely hard, poor grass cover.

Crum Park: Varieties - "AgriDark", Legend, Kikuyu Ryegrass



Result: *Supreme Sportsfield*

- Ryegrass Field 1: poor cover, suffering from drought stress.
- "AgriDark" Field 2: Premier team noticed improved ball control. Minimal renovation, ready for play
- Kikuyu Field 3: poor cover, still recovering from winter wear.

Huapai Domain: Varieties - "AgriDark", Ryegrass, Windsor Green



Result: *Supreme Sportsfield*

- "AgriDark" Field 1 & 2: good cover, minimum renovation
- Being used for summer play.
- Windsor Green Field 3: Still recovering from winter play
- Poor surface condition, Black Beetle.
- Ryegrass Field 4: Cricket Oval outfield, poor grass cover, with good cricket block.
- Water supply from field drainage and stormwater dam.

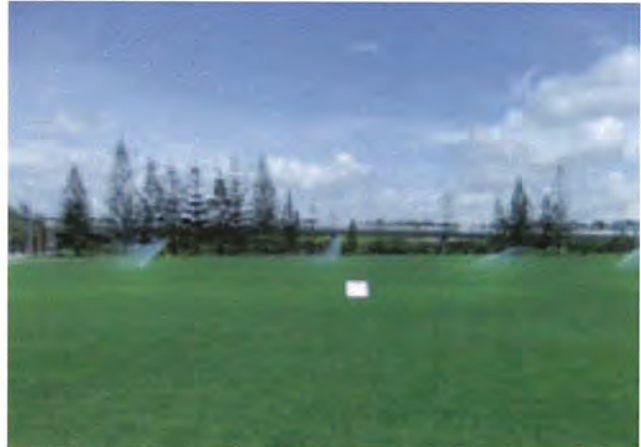
Victor Eve Park: Varieties - "AgriDark", Legend



Result: *Supreme Sportsfield*

- "AgriDark" Field 1: In good condition,
- Being played on nightly,
- Minimal renovation and water use
- Some signs of Kikuyu removal
- Mark Bowater discusses *Supreme Sportsfields* with Chris Burgess (6 Dec, 2010)

Becroft: Varieties - Seeded Kikuyu, Ryegrass



Result: **Field Closed**

- Seeded Kikuyu: Closed for renovation, September to February.
- Vast amounts of potable water used.
- Still recovering from winter wear
- Ryegrass Field: Still closed under renovation
- Practice area closed to renovation. Surface destroyed, replanting legend couch

Mairangi Bay: Variety - Seeded Kikuyu



Result: **Field Closed**

- Field closed due to intense renovation requirements
- Has been out of use since September as there is no grass cover
- Extensive mowing, watering and fertilizer will be required to regain surface

Bruce Pulman Park: Varieties - "AgriDark", Ryegrass



Result: *Supreme Sportsfield*

- "AgriDark" Fields: have tight dark green playing surfaces
- Currently in use with Rugby and Touch tournaments
- Minimum renovation and water used
- Ground cover resilient, preventing injuries
- Great traction in sports field surface for players

Auckland Council Field Trip Results

Auckland Councils field Trip - 6th December 2010

Current use		Quality	Location	Park	Field Type used	Grass Varieties used
In use	Hours of use	Sport				
No	Nil	-	Closed for repair	Auckland	Seddon Fields 4	Kikuyu/Ryegrass
Yes	15	Soccer	Low	(Central)	Seddon Fields 1	AgriDark Couch
Yes	15	Soccer	Medium		Seddon Fields 2	AgriDark/Ryegrass
Yes	8	Soccer	Low		Seddon Fields 3	Legend Couch
Yes	15-20	Softball/Touch	Low	Waitakere	Lawson Park 1	AgriDark Couch
Yes	6-8	Teeball	Low	(West)	Lawson Park 2	Ryegrass
Yes	10-15	Softball/Soccer	Low	Waitakere	Crum Park 1	Kikuyu/Ryegrass
Yes	18-20	Soccer/Touch	SSF	(West)	Crum Park 2	AgriDark Couch
Yes	10-12	Soccer	Low		Crum Park 3	Ryegrass
Yes	18-20	Soccer	SSF	Rodney	Huapai Domain 1/2	AgriDark Couch
Yes	8	Soccer	Low	(North)	Huapai Domain 3	Windsor Green
Yes	10	Cricket	Low		Cricket Oval Top	Ryegrass
Yes	10	Cricket	Low		Cricket Oval Bottom	AgriDark
Yes	25	Touch	SSF	Rodney	Victor Eeves 1	AgriDark Couch
Yes	0	-	Medium	(North)	Victor Eeves 2**	Legend Couch
No	Nil	-	Closed for Repair	North Shore	Mairangi Bay	Seeded Kikuyu
No	Nil	-	Closed for Repair	North Shore	Becroft Park 2	Seeded Kikuyu
No	Nil	-	Closed for Repair	Becroft Park 1	Becroft Park 1	Fescue/Ryegrass
Yes	25	Touch/Rugby	SSF	Papakura	Bruce Pulman 1-8	AgriDark Couch
Yes	0	Cricket	SSF	(South)	Cricket Oval	AgriDark Couch
Yes	?	Cricket	Low		Top Fields	Ryegrass

*SSF - Supreme Sportsfields ** Not in use as issues as issues over proximity to highway

Results - What we saw:

Renovations: Supreme Sportsfields provide the best transition from winter to summer sports, only requiring a few days for renovation and no field closure. Ryegrass was the next best. The worst was Kikuyu and seeded Kikuyu which was still under renovation and unusable

Use: The highest hours of use were Supreme Sportsfields (the highest being 25 hours per week). The lowest levels of use were the Kikuyu and seeded Kikuyu fields which were shut for renovation. At Becroft Park, Dave Biddle from RS said "These fields will be closed until the second week of February when we hope to open them for touch."

Surface Quality: The best was Supreme Sportsfields with 100% AgriDark Couch cover. The worst was seeded Kikuyu, followed by Kikuyu. Ryegrass had a thin, poor cover. Soil fields were extremely hard while sand fields retained a good level of resilience.

Recommendation: Supreme Sportsfields to be the new benchmark for the Auckland Council.



**APPENDIX I:
Artificial Turf
Maintenance
and Issues**

You can't beat natural turf

APPENDIX I: Artificial Turf Maintenance and Issues



An eyesore for non-sports people in our green open spaces.



Deep vacuuming to remove worn fibre and foreign bodies.



Worn fibre and foreign body waste needs to be disposed of.



Grooming which replaces dislodged crum-rubber for even surface.



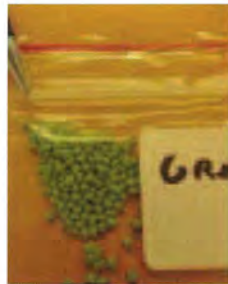
Dangerous metal objects pulled out of plastic fibre by magnetic sweep.



Disinfectants, Fungicides, Algaecides and other noxious chemicals.



Current technology still can't provide the quality of surface that natural grass does, despite mans' best efforts.

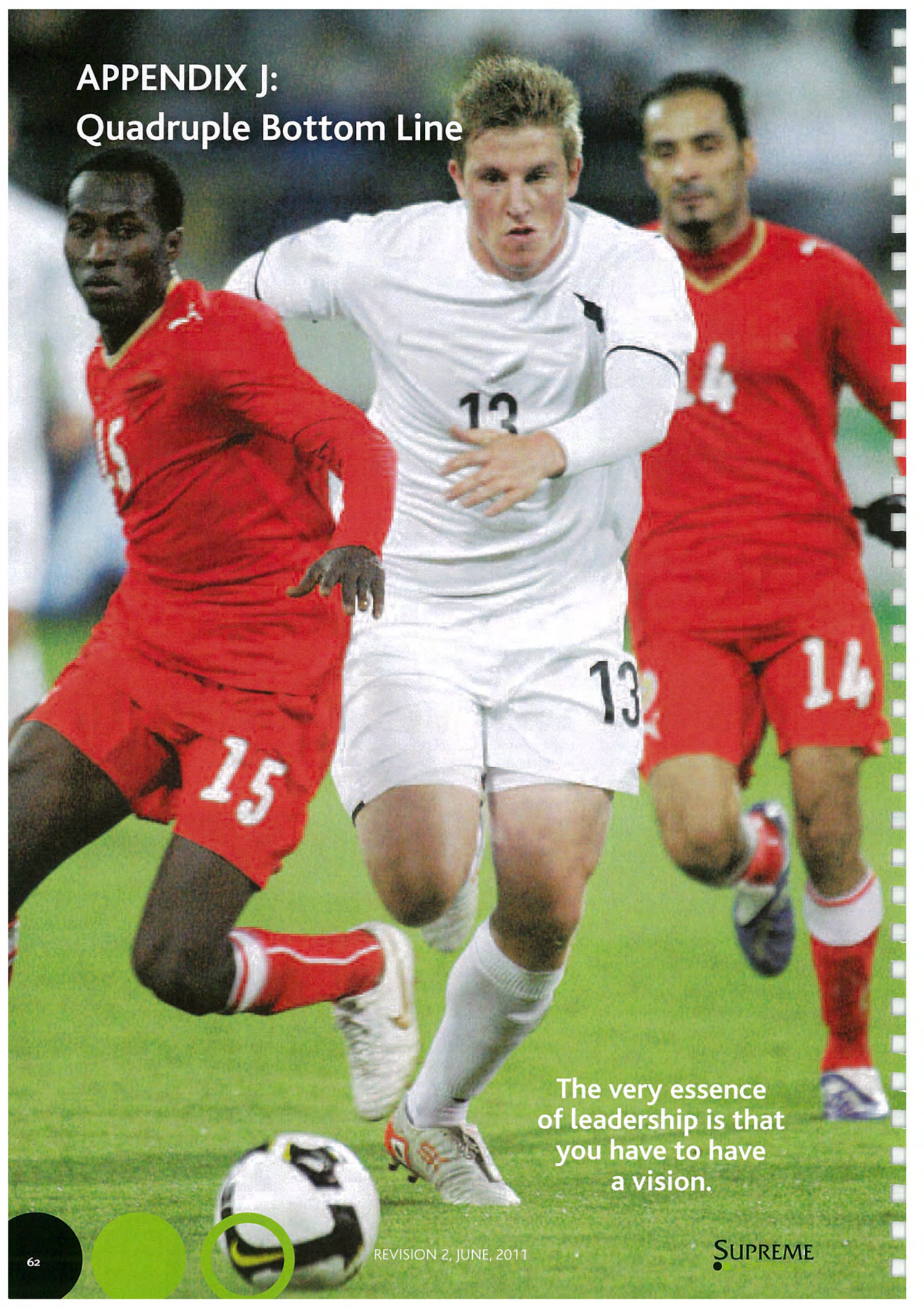


Currently artificial turf manufacturers are working on different designs of in-fill in the hope they can replicate the quality of natural turf.



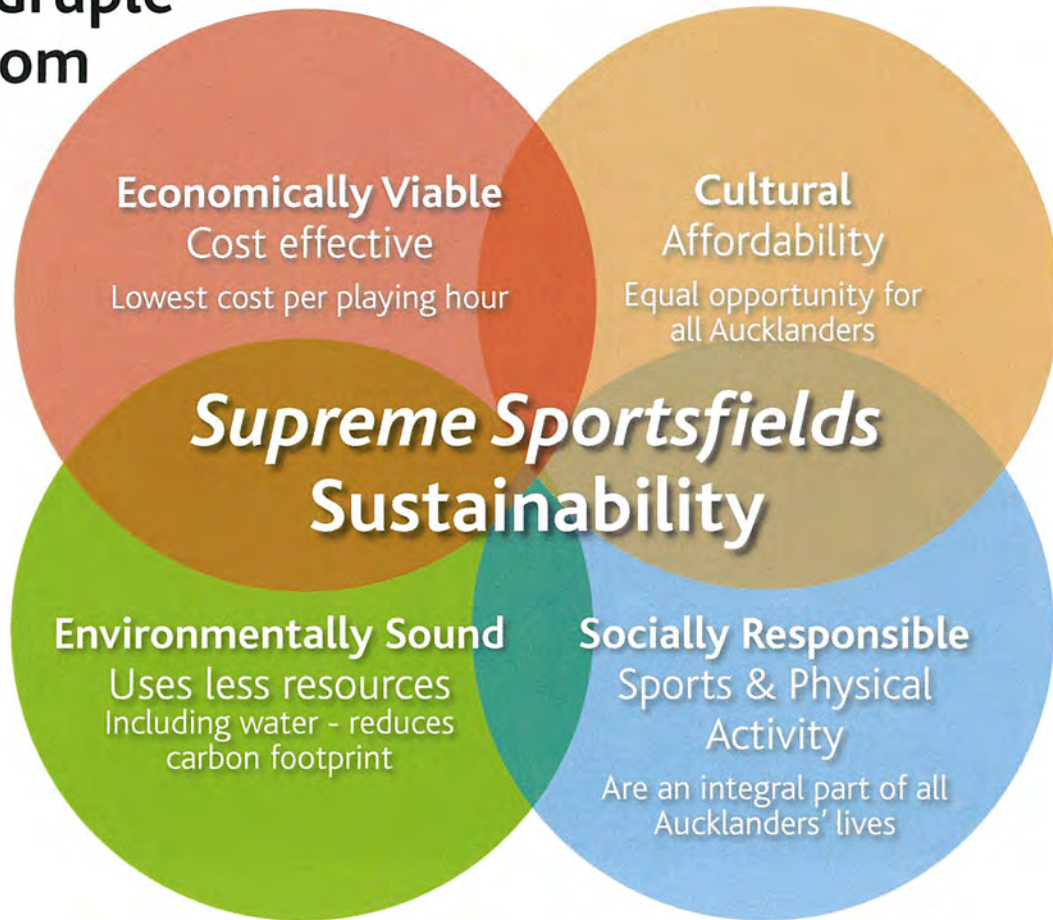
This renovated synthetic turf soccer field at Thomas Jefferson Park in Manhattan has a FlexSand base. It replaces crumb rubber, which has been linked to elevated lead levels.

APPENDIX J: Quadruple Bottom Line



The very essence
of leadership is that
you have to have
a vision.

APPENDIX J: Quadruple Bottom Line



Environment

Environmentally Sound: Reduced Water Use - Reduced mowing - Reduced Renovation



Health

Socially Responsible: More Activity - Less Field Closures - Better Experience - Less Injuries



Finance

Economically Viable: \$23.00 per playing hour per field - Less Maintenance Costs - Less Injury Health Costs



Cultural

Lower socio-economic groups cannot afford the higher charge rates for training and playing on artificial turf.



Environment Friendly Sustainable Turf



**Reducing Carbon
Emissions**



**Water
Conservation**

The New Imperative

- Aesthetically Pleasing
- Hard Wearing, Soft to Touch
 - Drought Tolerant
- Reduces Ecological Footprint
 - Self Repairing
 - Dark Green Colour
- Climate-Temperate Tolerant (Short Dormancy)

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Cervadon
AgriDark Turf Specialists