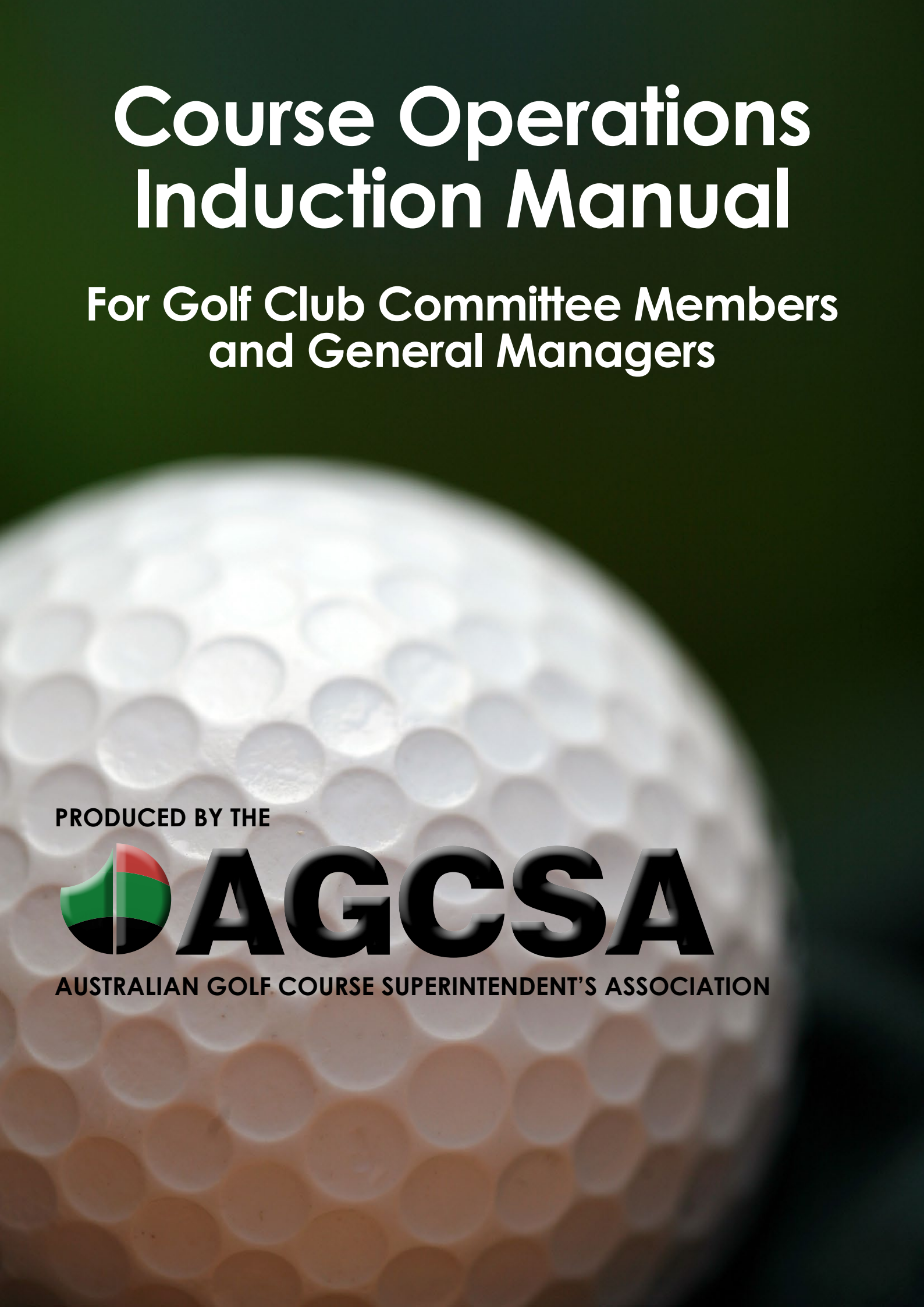
Course Operations Induction Manual

For Golf Club Committee Members and General Managers



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AUSTRALIAN GOLF COURSE SUPERINTENDENT'S ASSOCIATION

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FROM THE AGCSA PRESIDENT

Welcome to the Australian Golf Course Superintendents Association's **Course Operations Induction Manual** for golf club board and committee members and general managers. The purpose of this manual is to provide a resource for new board/committee members and general managers to assist in their understanding of golf course maintenance operations and the role their course superintendent plays.

We all share a passion for golf and it is in this spirit that the AGCSA has produced this manual. It aims to provide an insight into the extremely complex nature of the modern-day golf course superintendent role, demonstrate how a typical course maintenance operation is set up, as well as explain some of the course management terms and practices you are likely to come across during your tenure.

The game of golf currently attracts over 1.25 million participants annually and ranks as one of the most popular sports in Australia. It has developed into a large mini-economy and, as the 2004 study commissioned by the PGA of Australia found, the value of the goods and services that make up the Australian golf economy was estimated at $2.71 billion. The study also identified that an estimated 23,000 people were employed directly within the golf industry, a significant percentage being in the area of course management and maintenance.

Such significant statistics bring into focus the need for all aspects of a golf course operation to work in harmony and necessitates the understanding of how each area operates. The golf course is your club's primary asset and its conscientious management by your course superintendent and their team, together with the support of a proactive and understanding board/committee, will ensure that your club will continue to be successful and viable.

Having been a superintendent for the past three decades both here in Queensland and Victoria, I have worked with numerous committees and boards. If there is a common thread which I have come to associate with any successful course management operation it is communication – with communication comes understanding, with understanding comes respect.

This manual endeavours to enhance the knowledge base and engender a better understanding of what has become and continues to be a highly complex management art. Such a resource has been developed in response to our members' desire to ensure all parties with an interest in the management of the golf course have their views heard and respected. The AGCSA's hope is that this manual will be valued as a resource that will assist clubs throughout Australia achieve sustainable management practices through improved education at all levels of club and facility management.

Finally, if you haven't already done so, I strongly encourage you to take some time out to meet your course superintendent and their staff. By getting to know their operations you will discover the many unique management challenges they face day in, day out preparing your course. What I'm sure you will also find is a dedicated team striving to provide the very best playing surfaces possible for the enjoyment of all members and golfers.

Peter Lonergan
President, AGCSA
Course Superintendent, Coolangatta and Tweed Heads Golf Club
March 2014

PROTECTING YOUR KEY ASSET

The golf course is without question the key asset of any golf club or golfing facility. A living, breathing and evolving natural environment, its prudent and expert management at all levels is critical to the success and viability of a golf club. Every golf course has a value which can be identified in numerous terms – from the land on which it resides through to the vast range of machinery, products and equipment which are needed to ensure the ongoing maintenance of playing surfaces.

ASSET VALUE

- The land on which the golf course is sited
- Irrigation system and control technology
- Water treatment systems
- Water supply pumps (bore, dam)
- Machinery
- Maintenance facility
- Turf and plantings
- Fencing
- Course hardware
- Surrounding property values

ENVIRONMENTAL VALUE

- Green space
- Cooling effects
- Carbon absorption, oxygen generation
- Water filter
- Waste water diversion and utilisation
- Wildlife habitat
- Fauna preservation
- Replenishment of aquifer systems
- Reduce runoff, noise, dust
- Responsibility of board/committee

ECONOMIC VALUE

- Membership and green fee income
- Catering income
- Club employment
- Supplier incomes

SOCIAL VALUE

- Personal interaction
- Recreation
- Health and fitness
- Well being
- Community asset

Given the significant value of such an operation, a golf club board/committee has numerous responsibilities within the various portfolios and attending to all of these can be very difficult. Consistent to all clubs is the need for the golf course to be a major priority for decisions not only in the short-term but long-term also. Decisions made today can have a legacy that lasts for decades, so every effort needs to be made to ensure the best information available is obtained to assist the decision-making process.

A board's or committee's responsibility to its members is in the effective governance of the club, which includes the management of the golf course as its key asset. The club's course superintendent is the best person to advise the board or committee on the current and future needs of the turf surfaces, maintenance problems and solutions, budgetary requirements as well as any future plans for course construction or reconstruction.

Entrusting your superintendent and his/her team with the operational aspects of course management allows the board or committee to focus on longer term planning issues, which are critical to the effective management of the course as an asset. Utilising the knowledge and experience of your superintendent, your club can develop a very effective vision for the course, as well as strategic and business plans to assist short- and long-term management.

As will be addressed in the next section, the role of the modern day course superintendent has increased dramatically in recent times, especially in regards to OH&S, water management and

environmental management best practice. While your course superintendent is expected to take a leading role in assisting your club manage these areas, those who form part of a golf club's management structure (i.e.: the board, committee and general manager) are also legally bound. Along with the superintendent they can also be found liable should an accident happen at the club and it is found there weren't adequate procedures in place.

No more strongly was this demonstrated than in the verdict handed down by the NSW Land and Environment Court in the 2002 Warringah Golf Club pesticide spill trial. The court found the club itself was negligent for its role in a pesticide spill that killed 4.16 tonnes of marine and bird life and imposed fines and costs approaching $600,000. (A full report on this landmark case and its impact on the golf course industry can be viewed on the AGCSA's website – Australian Turfgrass Management Vol 5.6 'Warringah - An Accident Waiting to Happen').

As a board/committee or general manager of a golf club it is imperative that the following systems are in place:

- **Environmental Management System (EMS)**
  All directors take on the responsibility to ensure they have an environmental management system (EMS) in place for their course. While the superintendent may be entrusted with the administration of the EMS, it is imperative the club directors endorse the system and are actively involved in its annual review. The AGCSA has developed the Australian Golf Environmental Initiative for golf courses which can help your club develop an EMS that attains the international ISO 14001 standard for environmental management best practice. Visit http://environment.agcsa.com.au

- **Occupational health and safety management system (OH&S)**
  All directors take on the responsibility to ensure they are have an occupational health, safety and welfare management system in place for their club. While the superintendent may be entrusted with the administration of OH&S for the golf course, it is imperative the club directors endorse the system and are actively involved in its annual review.

- **Water Management Plan**
  Due to its community value, water must be managed in a manner that will satisfy club, public and regulatory requirements now and into the future. As a starting point, and to ensure the sustainable quality of playing surfaces and water consumption throughout the club, it will need to complete a comprehensive Water Management Plan that will identify potential improvements in water management efficiency and where long-term water supplies can be obtained. A Water Management Plan should be reviewed regularly with a view to continuous improvement. The AGCSA has developed an online water management plan to assist golf clubs in this process. http://water.agcsa.com.au

COURSE MANAGEMENT STRUCTURE AND ROLE OF THE SUPERINTENDENT

The art of golf course management has evolved infinitely since the 1700s when the first rudimentary form of the game of golf was played in Scotland. At the time of golf's inception, keeping sheep off greens was considered the only form of 'greenkeeping', while in the absence of mechanised maintenance equipment the local fauna (eg: rabbits and sheep) were utilised to keep playing surfaces clipped and manageable.

How times have changed. The past 50 years in particular has seen the game explode around the world and with the advent of televised tournaments golfer demands and expectations for top quality playing surfaces has risen exponentially. Golf courses have never been better maintained or presented than they are at present and this has been driven not only by increasing expectations placed on course management professionals, but also superintendents themselves who are now highly trained and highly regarded experts in their field.

As mentioned earlier in this manual the golf industry is worth billions of dollars globally (approaching $3 billion in Australia), with the sophistication of management in all sectors escalating accordingly. Golf course management has been a significant driver of this global value of the game of golf, and now sees those entrusted with the care of courses better qualified than ever. Many course superintendents have completed horticulture degrees, even Masters degrees and PhDs, while some are now also undertaking business management studies such is the changing nature of the profession. The perception that superintendents are mere 'grass cutters' and of similar ilk to Bill Murray's much maligned character in 'Caddyshack' is not only erroneous but borders on being disrespectful of what has become one of the most critical roles within any golf club.

Australia is blessed with some of world's best golf courses and over the years Australian course superintendents and their crews have developed a reputation for being among the leaders in course management across the world. An affinity for the land, knowledge of the local conditions which can vary dramatically from state to state, a strong work ethic and desire to present their patch of turf in the best possible condition are just some of the many attributes that your course superintendent brings to your club.

While the expectations of board/committees and the members is pressure in itself, superintendents have a much more demanding taskmaster to answer to – Mother Nature. Superintendents have to work with the vagaries of Australia's unique environment and as the global climate changes we are starting to see more weather extremes which are placing even further pressures on maintaining quality turf playing surfaces. As any superintendent will attest, Mother Nature can be a great leveller and no more was this demonstrated than in 2009 with the devastating bushfires in Victoria and widespread flooding in Queensland.

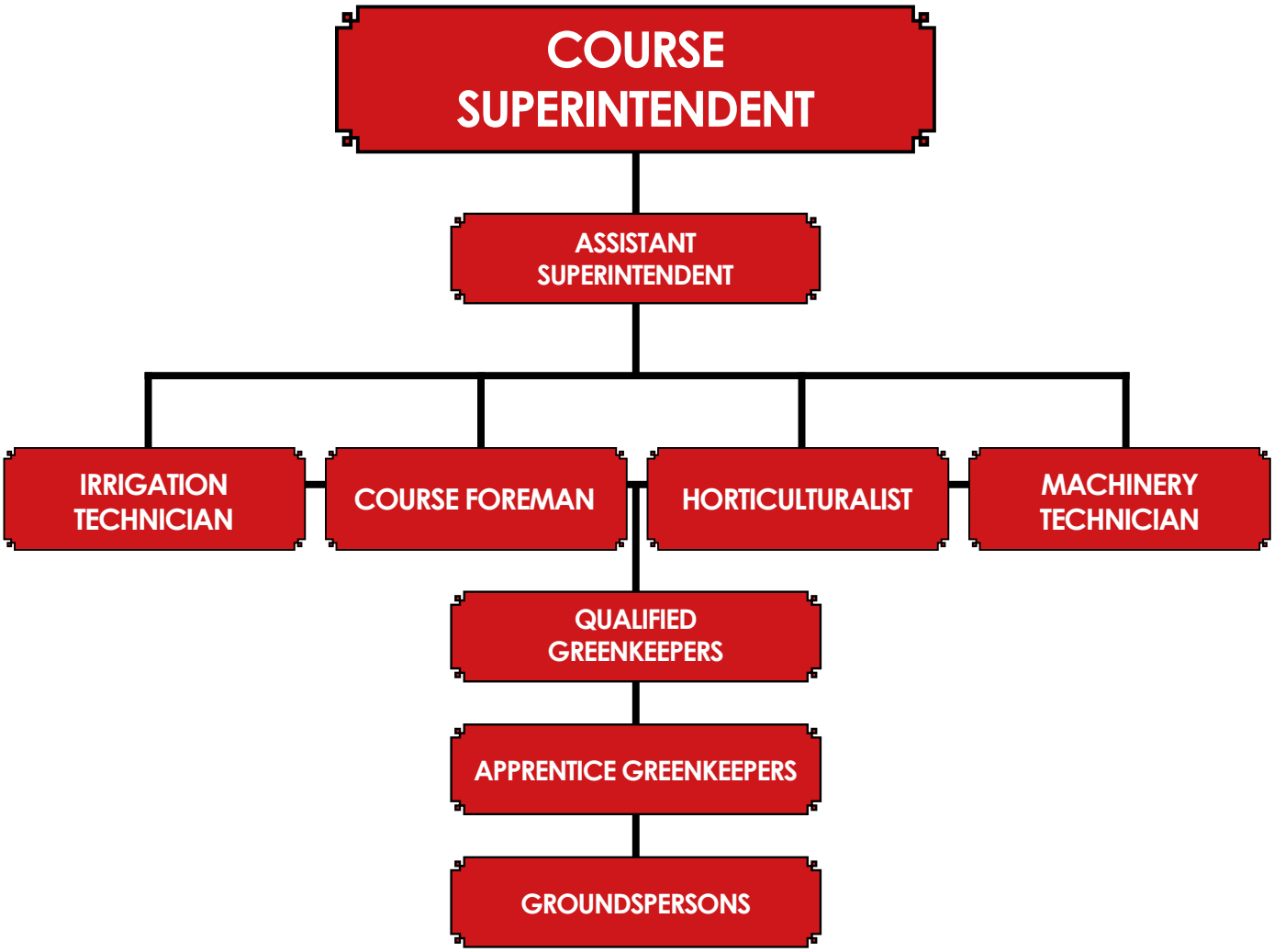
Your course maintenance team

If there is one message that the AGCSA cannot impress enough upon golf club managers and committees, it's that no two golf courses are the same and comparing courses is fraught with danger. Every golf course, even if just over the fence, has its own unique environment which necessitates varying management requirements. There can be enormous differences in budgets, course

maintenance equipment, playing demands, grass and soil types, climatic conditions and quality and quantity of water resources, all of which have a significant impact on course operations. Your course superintendent and his/her team work within these conditions on a daily basis and their intimate knowledge of these mean they are in the best position to communicate the unique circumstances within which they have to operate.

As a result, the make up of a course management team will also vary significantly. Some smaller courses can operate with a single superintendent/head greenkeeper and apprentice, while some have no paid maintenance staff and rely solely on the dedicated efforts of volunteers. At the other end of the scale you have 18-, 27-, 36- and 54-hole complexes which comprise anywhere up to 35 course maintenance personnel with a clearly defined management structure. Despite such variations and the way the superintendent goes about his/her job, they all have one common goal – sustainable, consistent quality playing surfaces for the enjoyment of members and golfers.

The complexity of modern golf course management has resulted in the development of specialised roles within golf course management and there is now a defined career pathway from apprentice through to superintendent. A typical course maintenance team can include some or all of the following positions: (Please consult with your course superintendent to determine the exact make up of your course management staff structure).



WHAT YOUR COURSE MAINTENANCE STAFF DO

The Superintendent

In regards to all aspects of course management, the buck stops with the course superintendent. The role of the modern superintendent is more complex than ever before and they are managers in every sense of the word. Regardless of the size of the facility or resources at their disposal, the superintendent is required to oversee a vast range of areas including, but not limited to, the following:

- Turf management and agronomy;
- Course development, planning and construction;
- Human resource management;
- Financial and asset management;
- Water management;
- Environmental management;
- OH&S management; and
- Public relations, education and ambassadorial roles

Typical tasks include planning and supervising maintenance practices of greens, fairways, tees, roughs, bunkers and out of play areas; supervising the planting and cultural practices involved with turfgrasses and other plantings; planning, organising and directing the construction/reconstruction of greens, tees, fairways, roughs, bunkers etc; keeping detailed records regarding all maintenance activities including, but not limited to, expenditure, equipment, personnel, chemicals, weather, OH&S; purchasing turf management supplies and materials within budgetary limits; acting as the primary conduit of information to the board/committee on all aspects of course management; training, motivating and directing all staff; preparing reports and annual maintenance budgets; and interviewing, hiring and discharging of course management employees[1].

The Assistant Superintendent/2IC

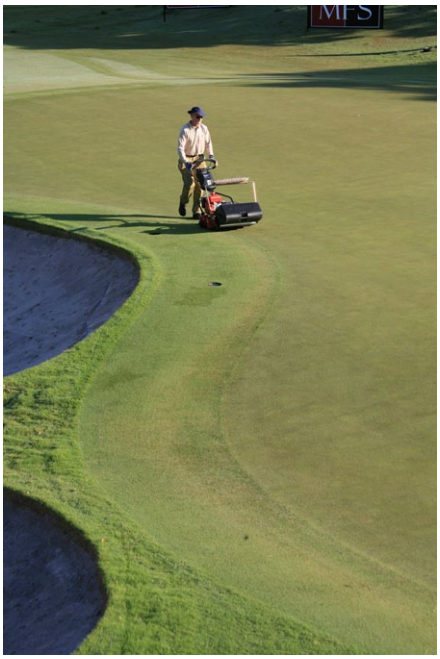
In many respects the assistant superintendent is the eyes and ears of your course superintendent. With the modern day superintendent spending more and more time in the office due to the increasing amount of paperwork/report writing that is now required, the role of the assistant is becoming more critical. The assistant superintendent is 'on the ground' most of the day and organises the carrying out of all course maintenance tasks as dictated by the superintendent and the course maintenance/course works schedule.

The assistant superintendent will be heavily involved in planning, scheduling and supervising the construction and maintenance of all surfaces in consultation with the superintendent and will undertake the duties of the superintendent in his/her absence. Assistant superintendents will often be responsible for instructing operators in the safe and efficient operation of all equipment associated with turf maintenance and supervises and participates in chemical and fertiliser applications and undertakes the appropriate training of operators in the field. In some larger establishments (eg: 36-hole facilities) there may be two assistant superintendents who oversee the day-to-day operations of each 18-hole course.

The Turf Technician

The turf technician/mechanic has perhaps one of the most critical roles in a golf course maintenance facility. They inspect, diagnose and repair mechanical defects/failures in various golf course maintenance equipment including diesel-, electric- and petrol-powered automobiles, trucks, rollers, mowers and other mechanical equipment used in utility work. They oversee a comprehensive

[1] *Adapted from Beard (2002): Turf Management for Golf Courses (Second Edition).*



preventive maintenance programme which includes the repair of failing equipment, keeping records of parts and labour needed to maintain each piece of equipment and placing orders for parts and supplies needed for equipment or service. In smaller establishments, the role of the turf technician will sometimes be combined with a greenkeeping role.

The Course Foreman/3IC

Under the general supervision of either the superintendent and/or assistant superintendent, the course foreman assists in making sure all daily work schedules are carried out and adhered to in a safe and efficient manner. They may be involved in overseeing various construction projects around the course and can double as irrigation technician or spray technician.

The Irrigation Technician

With water management becoming a critical component of golf course management these days, a skilled irrigation technician is a key role within the course maintenance structure. The irrigation technician operates, maintains and repairs the club's complex irrigation system from pump shed through to sprinklers. In conjunction with the superintendent and assistant superintendent the irrigation technician is also in charge of ensuring the club's Water Management Plan is adhered to, monitored and updated where and when required. In smaller operations this position will often be taken on by a more experienced qualified greenkeeper or another member of staff with specific skills in irrigation systems management.

Horticulturalist/Revegetation Officer/Environmental Officer

Some golf course maintenance crews will include a horticulturalist whose job is to oversee all horticultural aspects of the course, including maintenance of garden beds around the course and clubhouse, revegetation and regeneration works, maintaining an onsite nursery, collection and propagation of seedlings etc… Such members of staff have a strong understanding of natural resource/ revegetation principles along with a comprehensive understanding of indigenous vegetation to the area in which the course resides.

Qualified Greenkeepers

These members of your course management staff have completed their Certificate III Horticulture through a registered turf training institution (e.g.: TAFE) and undertake a range of specialist turf management tasks as part of the course maintenance programme. Senior qualified greenkeepers will often be given increased responsibilities such as irrigation technician, spray technician, OH&S officer or environmental officer.

Apprentices

A golf course turf management apprenticeship generally lasts three years and includes a mix of practical on course work and education sessions at a recognised turf training institution such as TAFE. Under the careful supervision of the superintendent/assistant superintendent/ foreman, apprentices will generally be given a wide range of tasks to undertake to help skill them in the art of greenkeeping.

Groundspersons

Generally a member of the maintenance crew who has no formal greenkeeping qualifications who undertakes a range of general course maintenance tasks as outlined by the superintendent's course management programme.

Some other positions you may come across or which are included as part of the existing roles within your course maintenance staff structure may include.

- **Spray technician:** This person will, under the supervision of and in conjunction with the course superintendent/assistant superintendent, look after all aspects of the club's spraying programmes (e.g.: herbicides, fungicidices, insecticides) and fertiliser programmes.
- **OH&S Coordinator**: With the rise in legislation relating to work place safety, OH&S has become a very important aspect of golf course maintenance operations. Often a senior qualified greenkeeper will take on the role of OH&S officer and it is their job to ensure all OH&S procedures are in place and adhered to by the rest of the maintenance staff.
- **Casuals**: During the busy spring/summer periods (ie: growing season), the superintendent may employ a number of casuals to assist with general day-to-day maintenance requirements around the course.

Communication

A clear line of communication needs to be established through the course management structure. The structure will vary in complexity depending on the size of the staff and detailed position descriptions are necessary in developing these clear lines of communication. They ensure clarity of roles and that key management obligations are addressed. It is essential that every member of the course management team is provided with a position description.

Professional Development

Given the dynamic nature of golf course maintenance, ongoing professional development is critical for your course superintendent and their maintenance staff. Where possible the attendance of conferences, workshops, trade days and field days, whether conducted by the AGCSA, the various state superintendent associations or industry companies, should be encouraged.

The AGCSA has developed an accreditation programme for course superintendents and assistant superintendents whereby they can earn points for attending educational events. Attending such events is a sign that your course maintenance staff are abreast of the latest technologies, product information and maintenance techniques which will ultimately have an impact on the presentation of your golf course.

YOUR COURSE SUPERINTENDENT

Did you know…. that as well as being an agronomist, accountant, human resource manager, project manager, water resource manager, OH&S manager, educator, counsellor and ambassador, your course superintendent potentially faces in excess of 390 environmental risks during a typical day's maintenance of your golf course. ***Source: Environmental Business Solutions***

TURF MANAGEMENT PRACTICES

There are many and varied turf management practices that can be employed to produce optimum playing surfaces and your course superintendent is the best qualified person to inform you of the specific routines/requirements that are scheduled at your course.

Of all the management practices that your superintendent employs, perhaps the most critical is the regular renovation of the club's playing surfaces (greens, fairways, tees and surrounds). Renovations, whether in the form of coring, tining, scarifying or topdressing, can be a very stressful period for both course maintenance staff and golfers alike due to the inherent disruptions such practices can cause to play. You can be assured that your course superintendent and his team are acutely aware of the interference such practices can cause to your members, but at the same time it is imperative that management and members alike realise that such practices are a necessary and vital component to ensure the ongoing health of your club's turf surfaces.

With competition between golf clubs as fierce as ever, scheduling renovations is becoming an increasingly difficult prospect for superintendents, but the AGCSA recommends that renovations be carried out twice a year as a minimum. The AGCSA has found that clubs which have reduced their renovation programme to one event per year have often witnessed the development of major agronomic problems with their surfaces, which in some cases has necessitated costly reconstruction work to bring them back up to a playable standard.

Why renovate?

Intensely managed turfgrass areas (such as putting greens) can often develop an organic layer above the soil and below the green tissue of the living cover of grass. This 'thatch' layer, as it is known, is composed of a combination of dead organic debris, decaying plant material and the living roots, crowns and stems of the grass[2].

While a small amount of thatch can be beneficial, excessive thatch built up over time can cause a number of serious management issues for your club's playing surfaces. For the superintendent it can mean increased likelihood of disease, reduced water infiltration and wetter, softer putting surfaces. During the summer months excessive organic matter results in dry patch and increased heat stress. From a golfer's perspective excessive organic matter can be frustrating as it leads to increased ball marking, foot printing and inconsistent ball roll. Along with the challenges it presents to the golfer and the superintendent, it can also have some dramatic negative impacts on the function of the entire profile of the playing surface.

The key principle behind renovating your playing surfaces is to regularly remove a percentage of this organic matter to provide a better environment for the turf to thrive and thus prevent the development of the issues mentioned above.

[2] *Adapted from Christians (2007): Fundamentals of Turfgrass Management (Third Edition).*

Renovations can be likened to getting your car serviced. Just as you take your car to a mechanic on a regular basis to ensure everything is in working order, think of the course superintendent as the 'mechanic' who through a specific renovation programme is ensuring your club's turf surfaces are finely tuned and in optimal condition. Just as your car may be off the road for a day or two while it is being serviced, inevitably there will be some downtime for your turf surfaces as they are renovated and then left to recover. As the saying goes, short-term pain equals long-term gain and a regular

renovation programme will ensure the ongoing health of your turf surfaces which in turn will provide golfers and members with quality surfaces on which to enjoy the game.

As has been pointed out earlier in this manual each course is different and every superintendent will have devised a renovation programme specific to the needs of their turf surfaces. The type and frequency of renovations performed at your club will be dependent on a variety of factors, including, but not limited to, the resources available, events/tournaments scheduled by the club, traffic levels, grass types and conditions, weather, climate, soil types, etc.

Given their disruptive nature, the scheduling of renovations needs to be decided upon by all concerned parties – superintendent, committee, general manager – but the heath and wellbeing of the turf should be the overriding focus when doing so. To eliminate potential conflict, the scheduling and type of renovations to be carried out must be communicated at all levels within club management as well as to members.

COMMUNICATION IS THE KEY

The diversity of responsibilities involved in golf course management sees a variety of people involved in the decision-making processes. This can involve committee/board members, the general manager, administration staff or any member of the course management team. It is therefore imperative that decisions are made consistently. The simplest means of achieving this is to ensure adherence to a communication framework.

Everyone involved in the decision-making process has particular skills to offer. It is, however, the course superintendent who has the most highly developed and necessary golf course management skills, and it is recommended he/she be entrusted with the responsibility of communicating objectives for the course to his/her staff and to be responsible for the daily operational issues on the course.

The skills and knowledge of the course superintendent are also vital to the golf club's strategic or longer term planning. Superintendents are often able to foresee implications for the course of current decisions, and if involved in the process, can contribute positively to a more desirable, sustainable outcome.

The communication process can be strengthened by adopting some of the following practices:

- All decisions at board/committee level to be documented;
- Any communication to the superintendent regarding board/committee decisions to be in written form;
- Course maintenance operations and plans to be documented;
- Summarise progress in regular written reports (monthly) to board/committee and general manager;
- All information from course superintendent to board/committee and general manager to be in written form; and
- Any course-related meetings to adhere to an agreed agenda.

The complexity of the superintendent's role is placing greater importance on his/her need to have a 'voice' at board/committee level, either in written or direct verbal form. For these opportunities to be well utilised, the superintendent should be well prepared for the meeting with a clear agenda and understanding of the relevant issues and the board/committee should be prepared to take the opportunity to ask appropriate questions of the superintendent. Feedback is very important to help the superintendent develop a clear understanding of the direction and expectations of the board/committee. (Meeting agenda and feedback templates are available from the AGCSA website www.agcsa.com.au)

Key relationships - Board/Committee-Superintendent

The superintendent's objective is to provide the board/committee with the information it needs in order to make informed decisions in the best interests of the club. Board/committee members may only be involved in club management for a short period of time and it is vital these members quickly understand the value of the golf course as an asset to further enhance the decision making process. Golf clubs should have a clearly defined management structure and board/committee members must adhere to the structure to avoid the embarrassment that can result from ad hoc decisions. The more successful golf club committees focus on the strategic planning for the club and avoid providing operational opinions to employed professionals.

Key relationships - General Manager-Superintendent

The relationship between the general manager and the superintendent is vital to the stability and success of any golf club, and the communication lines must be open and honest with a high level of respect for each other's role. In golf clubs where the general manager serves as the conduit between the superintendent and the board/committee, the superintendent must be clear in communicating the message he/she wants to reach the board/committee, so that the general manager can also accurately convey them. Written communication is strongly encouraged.

The general manager should be well informed of issues affecting course management, enabling him/her to act as a reliable advocate for the superintendent at board/committee level. It is equally beneficial if the general manager can keep the superintendent appropriately informed of the issues affecting the club's management. A greater understanding will result in less conflict or tension that may result from poorly communicated decisions at board/committee level.

Induction manuals

All new staff members should be inducted into their roles, the club's policies and their rights and obligations. Similarly, each new board/committee member should be inducted so he/she has a clear documented understanding of his/her role within the golf club. The AGCSA recommends that this manual be included as part of this process to give the new office bearer a good understanding of the course management side of their club's operations.

Performance evaluation

The dynamic nature of golf course management often means that a club can be diverted from its key objectives. These objectives need to be documented and made available to all staff to prevent this from happening. Feedback should be provided to the superintendent on his/her performance in achieving these objectives in the form of an annual performance evaluation. Any performance evaluation should be documented, signed by all parties and include both positive feedback and identified areas for improvement. An evaluation template is available from the AGCSA.

Conflict resolution

The source of many conflicts regarding golf course management can be minimised if an appropriate communication framework is in place, agreed strategies and policies are documented and communicated and regular feedback on performance provided. However, should there still be a source of conflict, the AGCSA recommends the following strategy:

- Co-ordinate a meeting between the conflicting parties to identify the issue(s);
- Allow all parties to communicate their views, including provision of any relevant facts;
- Document all points of view and summarise the key issue(s);
- Allow all parties to outline what they have learned about the issue(s) as a result of the meeting;
- If possible, reach a documented resolution. If not, schedule a follow up meeting within an agreed timeframe (one week) with the specific aim of a resolution; and
- Agree on and document a timeframe for the issue(s) to be addressed.

It is recommended the board/committee or course superintendent appoint an independent mediator to help facilitate the process and reach a mutually agreed resolution.

HOW THE AGCSA CAN ASSIST…

The Australian Golf Course Superintendents Association (AGCSA) was formed in 1981 to further the profession of golf course management in Australia. Since that time the association has grown steadily in size and now boasts over 1030 members from Australia and around the world. The AGCSA vision statement is as follows:

"The AGCSA is committed to the ongoing professional development and support of all those involved in the golf course maintenance industry."

It's the AGCSA's ultimate goal that:

"All golf courses have the best possible playing surfaces and adjacent environment within the limitations of available resources."

As the peak body for the golf course maintenance industry, the AGCSA is in a great position to assist golf clubs in their quest to provide the best course conditions and surrounding environment for members and players. Those clubs whose course management personnel are members of the AGCSA can be assured that their employees are supported by an organisation that strives to further their professional development through the provision of ongoing conferences and workshops and a wide range of membership services.

If your superintendent or course management staff are members of the AGCSA they have an impressive array of management tools, resources and educational opportunities available to them. These include:

- The award-winning **Australian Turfgrass Management Journal**. Produced bi-monthly, ATM is widely recognised as the turf industry's foremost authority and contains the latest in turf industry research updates, features, profiles and product information. Click here to find out more about ATM or to subscribe.

- The **Australian Turfgrass Conference and Trade Exhibition**. This annual conference is the largest turf industry gathering in the Southern Hemisphere and exposes delegates to the latest in turf management research, practices and ideas. A central component to the week-long conference is the two-day trade exhibition which contains all the leading turf industry machinery, product and service providers.

- The **AGCSA national workshop series**, twice a year, in state capitals. Examples of past workshops include water management planning, sustainable golf course management (presented in conjunction with The R&A), presentation and communication, spraying management and techniques, chemical spill response, environmental management systems development, human resource management as well as various turf research field days.

- **AGCSA Action** members newsletter published biannually;

- Weekly email newsletter **The Cut** keeping members up to date with the latest industry news and events. Click here to subscribe to The Cut.

- The **AGCSA Accreditation Programme (AAP)** for golf course superintendents and assistant superintendents. The AAP encourages members to undertake continual training throughout their careers and thereby promote the position of superintendent as a highly skilled and professional role. Members who attend accredited events receive Continuing Education Points, of which a certain number must be achieved within a two-year period to attain/maintain accreditation status. Click here to find out more about the AGCSA Accreditation Programme

- Analytical, diagnostic and consultancy services through the AGCSA technical services division – **AGCSATech.** AGCSA members receive a 20 per cent discount on all AGCSATech services which range from soil nutrient and soil physical analysis; disease, pest and weed diagnosis; plant tissue analysis; water analysis and a range of consultancy services (eg: course audits, maintenance specifications). Over the years the AGCSA has undertaken industry-leading research into such areas as the effects of reclaimed/recycled water on turf, *Poa annua* trials and a range of trials looking at bentgrass and couchgrass response to various management techniques. **All funds generated by AGCSATech services are put back into turf industry research projects which benefit our members and the wider turf industry**. Click here to find out more about AGCSATech services.

The AGCSA can also aid golf club management by:

- Helping clubs find the right golf course maintenance personnel, whether it is a superintendent or turf management apprentice. The AGCSA can provide clubs with information on the local or national scene and advertise any golf course maintenance position through the AGCSA website (AGCSA member rate $220, non-member rate $250).

AGCSA JOB WATCH

Did you know...the AGCSA's Job Watch section http://www.agcsa.com.au/jobs is the turf industry's leading online job resource and is the first place where turf industry members look for new jobs or placing job ads.

The Job Watch section attracted 72,066 unique visits from 1 Jan 2009 to 31 Dec 2009, an average of 197 unique visits per day – Google Analytics statistics, Feb 2010

- Assisting clubs with information on how to arrive at the best applicant with the AGCSA's guide to employing a superintendent.
- Providing a checklist for those clubs contemplating moving away from employing an in-house superintendent to contract maintenance.
- Providing an array of agronomic diagnostic, analytical and consulting services through its dedicated technical division AGCSATech (see above for further information).

AGCSA HR and Best Practice Service

In 2007 the AGCSA started up its HR and Best Practice Service, headed up by inaugural Australian Golf Digest Superintendent of the Year Daryl Sellar (Glenelg Golf Club, SA), to help improve management practices of Australian golf courses and their superintendents. The AGCSA Best Practice Service can provide golf clubs with a detailed overview of their course and its maintenance requirements, with the ultimate aim of improving course standards and increasing member/

player satisfaction. The service is designed around working with the superintendent and management to analyse, prioritise and make recommendations in regards to maintenance practices to improve course quality with the resources available. Such a service provides the club with a positive direction in which to focus maintenance practices.

At the conclusion of the service the superintendent will be able to clearly demonstrate to board and management a detailed audit of course maintenance, the allocation of man hours and budget strategy so that both the superintendent and management can make informed and measured decisions that will impact on the course quality and condition. The Best Practice Service can also analyse and recommend OH&S, environmental management and HR practices. At the end of the day it will be able to provide benchmarking for course maintenance.

For further information about any of the above AGCSA services or membership, contact the AGCSA.

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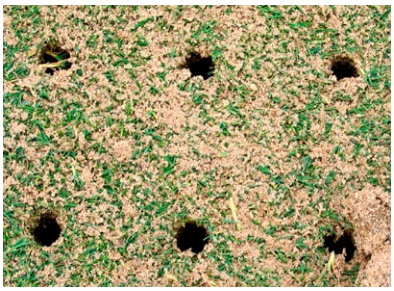
GLOSSARY OF TURF MANAGEMENT and COURSE MAINTENANCE TERMS

The following list of terms is intended to provide a better understanding of course management/ maintenance terms you are likely to come across. While many of the explanations are generic in nature some will have different implications and applications at your course. It is imperative therefore to liaise with your course superintendent about the specific requirements at your course.



Aeration
The creation of a passage for air to pass into the soil profile in an effort to restore the appropriate balance of air, water and mineral components within the soil. Frequency and types of practices associated with aeration can vary greatly from club to club and can be dependent on resources, time, events, water quality, traffic levels, grass type and condition, weather, climate, soil type, etc. It is recommended you consult your superintendent regarding the specific requirements of your course.

AGCSA
The Australian Golf Course Superintendents Association. The AGCSA was formed in 1981 to further the profession of golf course management in Australia. Since that time the association has grown steadily in size and now boasts over 1030 members from Australia and around the world. The AGCSA is committed to the ongoing professional development and support of all those involved in the golf course maintenance industry. Its ultimate goal is that all golf courses have the best possible playing surfaces and adjacent environment within the limitations of available resources. See the 'How the AGCSA Can Assist' section in this manual for more information.

Augusta Syndrome
A colloquial term used within the golf course maintenance industry to describe the mindset of golfers that all golf courses should present and play like The Augusta National Golf Club which annually hosts the US Masters. Such a mindset fails to take into account the huge financial, equipment and labour resources such a club has at its disposal in order to produce a course at such a high level.

Bedknife
The stationary bottom blade of a reel mower against which the reel blades move to produce a shearing cut. Cutting heights are determined by the height of the bedknife cutting edge above the surface. Bedknives need to be regularly ground to provide optimum cutting conditions.

Best Management Practice
A best management practice is a technique or methodology that, through experience and research, has proven to reliably lead to a desired result. A commitment to best practice is a commitment to using all knowledge and technology available to ensure success. Examples of golf course best management practice include ensuring your club has an environmental management system and water management plan in place.

Bentgrass (or creeping bentgrass)
A cool-season turfgrass variety most commonly used on putting greens in cooler and transitional climates or cooler portions of warm climatic regions. Creeping bentgrass cultivars can sustain high shoot density at very close mowing heights. Examples of bentgrass varieties include Penncross, A1, A4, G2 and G6. Newer varieties include Mackenzie, Tyee, 007, Authority and Dominant Xtreme.

Biological products
These products utilise naturally occurring materials to stimulate plant and/or soil health – eg: seaweed/kelp extracts.

Chemical resistance
Any population of turf pest (insect, disease) has a number of individuals who have the ability to survive chemical applications that will control the majority of the population. A resistant population develops when the naturally resistant individuals survive and multiply following repeated applications of the same or chemicals with similar modes of action.

Compaction
The compression of the soil resulting in reduced soil pore space (the spaces between soil particles); decreased movement of water and air into and within the soil (hence poor root health); decreased soil water storage, and increased surface runoff and erosion potential. Frequency and types of practices associated with remedying compaction are dependent on resources, time, events, water quality, traffic, grass type, climate and soil type. Consult your superintendent regarding the specific requirements of your course.

Cool-season turfgrass
A cold-tolerant turf species best adapted to growth during cool, moist periods of the year and commonly having a temperature optimum of between 16-24°C. The optimum growth period for cool-season grasses is during spring, whereas growth is slowed during the height of summer. Cool-season grasses generally have a shallower rooting system than warm-seaosn varieties. Examples of cool-season turfgrasses include *Poa annua*, bentgrass, ryegrass and fescue.

Coring
The process by which holes are punched into the turf surface and vegetative material removed to assist air movement into the underlying soil profile. Coring is usually undertaken as part of a surface renovation programme and is one of the most effective means of reducing both thatch build up and compaction. The AGCSA recommends that renovations are undertaken a minimum of twice per year to ensure the ongoing healthy and vitality of a club's turf surfaces.

Couchgrass (also known as bermudagrass)
A warm-season turf variety used on fairways and greens in warm climate regions. Examples of couchgrass varieties include Santa ana, Legend, Wintergreen, Windsorgreen, Grand Prix (fairway and tee varieties) and 328, TifEagle and Tifdwarf (greens varieties). Couchgrass is generally sensitive to cool temperatures and will go into dormancy in cooler climates during the winter months.

Cultivar
The term cultivar is short for 'cultivated variety' and is a plant of a single species that differs from another in specific characters, such as disease resistance, leaf width or pest resistance. Determining the right cultivar for a golf course can be based on a range of factors and it is recommended that a series of trials be undertaken to ascertain which cultivar performs the best under local conditions.

Cultural practices
Golf course management activities that are not naturally occurring, but undertaken by superintendents and golf course maintenance staff to improve the condition of turf playing surfaces. Such practices include mowing, fertilising, irrigating and aeration etc…

Desalination
The process of removing salt concentrations from high salinity water. A number of golf courses around Australia have desalination systems in place or are in the process of construction. Desalination is a well proven high-tech system that provides a means of using previously unusable high salinity ground water and effluent. Desalination plants have a relatively high construction and operating cost and a high electricity requirement. There is also the disposal of the concentrated brine that is a by-product of the desalination process.

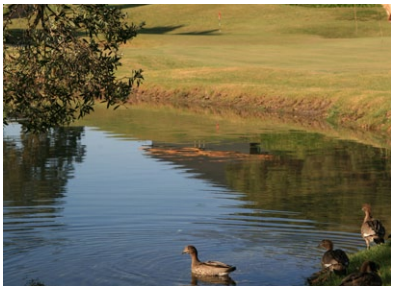
De-thatching
The process of removing excessive thatch/organic matter accumulation either mechanically (e.g.: by vertical mowing) or biologically (e.g.: topdressing) to promote new, finer textured growth primarily in greens, surrounds, tees and fairways. Frequency and types of practices associated with thatch management can vary greatly from club to club and can be dependent on resources, time, events, water quality, traffic levels, grass type and condition, weather, climate, soil type, etc. It is recommended you consult your superintendent regarding specific requirements of your course.

Disease
Disease in turfgrasses develops from an interaction between a susceptible plant, a disease-producing organism (pathogen), and an environment favourable for disease development. Diseases occur when environmental conditions become favourable for the build up of pathogen populations and/or cause an increase in the susceptibility of the plant. When this happens, turfgrass loss can occur. Common turfgrass diseases include spring dead spot, pythium, rhizoctonia, anthracnose, fusarium and dollar spot.

Dormancy
The resting stage a plant usually passes during which most or all growth stops. In coughgrass fairways for instance during winter, dormancy is manifested by the grass turning a brown colour. (It is important to note that although looking aesthetically unpleasing, the couchgrass provides just as good a playing surface while dormant.)

Double cutting
The process of mowing a playing surface (primarily greens but sometimes fairways) twice, one immediately following the other or in two directions at the same time. Double cutting is most often employed in the lead-up to and during major club tournaments to enhance the presentation of playing surfaces.

Dusting
A light application of sand or soil to the turf surface to assist the diluting of thatch levels. With renovations becoming difficult to schedule, superintendents are turning to less disruptive methods of renovation, with dusting one such option. Bentgrass or couchgrass greens in particular benefit from a regular dusting programme which can range from every two weeks during the height of the growing season through to once every six weeks during winter.



Environmental Management System (EMS)
An EMS is an organisational approach to environmental management based on a concept of continuous improvement in all aspects of a golf club's environmental performance. e-par is the EMS that forms the basis of the AGCSA's Australian Golf Environmental Initiative adapting the principles of ISO 14001. ISO 14001 is a set of guidelines by which a club can establish/strengthen its environmental policy; define objectives and targets; implement programmes to attain environmental goals and review its systems to promote improvement.

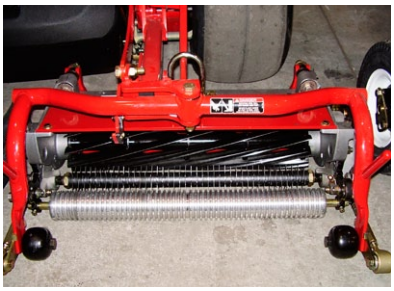
Fertigation
The word 'fertigation' is a combination of the words 'fertilisation' and 'irrigation' and is a method of fertiliser application via water through the golf club's irrigation system. A carefully controlled fertigation programme has the potential to improve efficiency of applied nutrients and can be used on a daily basis to provide a more uniform response from the turf. Fertigation will only be successful if the irrigation system applies water uniformly.

Fertilisers
Any of a large number of natural and synthetic materials, including manure and nitrogen (N), phosphorus (P) and potassium (K) compounds, spread on or worked into soil to increase its capacity to support plant growth. In turf management, fertiliser options include controlled or slow release, granular, liquid or soluble.

Fescue
A cool-season turf variety traditionally found on the links style courses of England, Scotland, Wales and Ireland. Examples include tall fescue, fine fescue, hard fescue, sheeps fescue, Chewings fescue and creeping red fescue. Fine fescues are known primarily for their shade adaptation and low nitrogen requirements.

Foliar feeding
The process of applying a dilute solution of liquid fertiliser to the turf with the objective being for nutrients to be taken up through the leaves of the plant. Often combined with a granular fertilisation programme.

Fungicide
A chemical substance or cultured biological organism used to kill or suppress fungal agents in plants. Fungicides can be divided into two categories - 'contacts' (those which control fungi on the outer surface of the plant) and 'systemics' (those which are absorbed by the plant through leaves or roots and attack fungi from within). Common fungal diseases of turf include anthracnose, rhizoctonia, pythium and dollar spot.



Groomers
Grooming reels generally sit between the front roller on a cutting unit and the start of the cutting cylinder. These groomers, whether in the form of small vertical cutting reels or brushes, are often employed to improve the after-cut presentation of a playing surface. In couchgrass greens groomers will be used to remove grain.

Herbicide
A chemical substance or cultured biological organism used to kill or suppress the growth of plants. Herbicides are broadly defined as either pre-emergent (applied prior to the emergence of a weed) or post-emergent (applied to the foliage of a weed after emergence from the soil). The ability of an herbicide to control weeds within a turf stand without killing or injuring desireable turf species is called 'selectivity'.

Hydrophobic soil
A soil that is water repellent. Hydrophobicity can be caused by a number of factors including, but not limited to, excessive organic matter content and soil compaction. Symptoms include irregular patches of hard, dry soils which are difficult to re-wet.

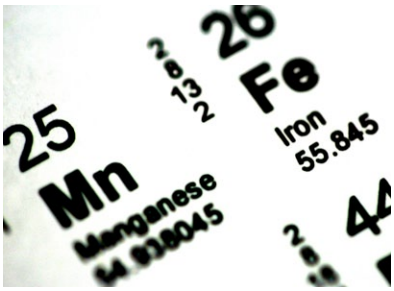
Indigenous plants
Those that are naturally occurring in a specific site. Australia is blessed with an abundance of indigenous plants which are increasingly being incorporated into golf course revegetation plans and course master plans to improve biodiversity value.

Insect pest
Many insects occur naturally within the turfgrass ecosystem, but only a few become a pest when their reliance on the turf plant as a food source is to the detriment of the turf's health. This can either be due to pest population numbers, or reduced ability of the turf to cope with pest demands due to other stress factors (e.g. wear, salinity, mowing heights, compaction etc). Common insect pests of turf include African black beetle, stem weevil, billbug, mites, sod webworm and couch fly.

Insecticide
A chemical agent that kills insects. Many of the modern day insecticides have short residual activity and must be timed properly to achieve adequate insect control. A popular alternative to chemical control of insects is the use of biological controls which use pathogens, such as bacteria and nematodes.

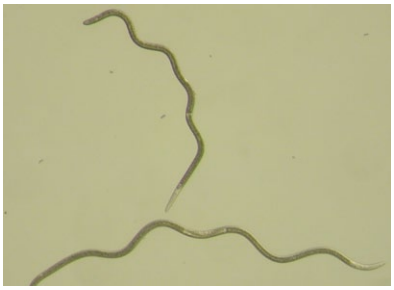
Integrated Pest Management (IPM)
An IPM programme is a multidisciplinary, ecologically-based pest management system that uses all available methods to keep pests at acceptable levels while minimising the effects on people, environment and turf. Options include pesticides, genetic, regulatory, biological and cultural solutions. IPM requires an understanding of turf conditions and characteristics; surveying pest types and levels; defining damage thresholds; developing monitoring and record-keeping programmes; and developing pest control strategies.

Line planting
A method of vegetative planting whereby a machines creates a furrow into which turf sprigs are placed. Line-planting is a common method of converting golf course fairways.



Micronutrient
A chemical element necessary for plant growth in small amounts (eg: iron (Fe), zinc (Zn), manganese (Mn) and copper (Cu)) as opposed to the macronutrients nitrogen (N), phosphorus (P) and potassium (K). Of all the micronutrients, iron is the one most likely to be deficient in turfgrasses. One of its primary functions in the plant is its involvement in the formation of chlorophyll.

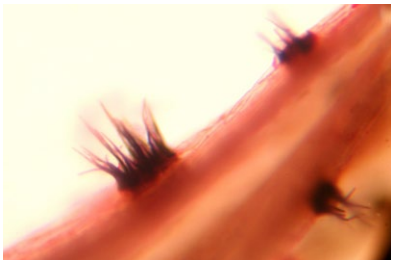
Monitoring
The practice of observing and documenting the effects of turf management treatments and practices which is critical in evaluating their benefits. Monitoring is the regular observation and recording of activities taking place in a project or programme. It is a process of routinely gathering information on all aspects of such projects/ treatments.



Nematode
Microscopic unsegmented worms, many of which are parasites on turf plants, living either inside or outside the roots. Left untreated parasitic nematodes can cause widespread damage and can often exacerbate other turf disease symptoms. Common examples of parasitic nemtodes in turf include sting, sprial, stubby root, sheath, ring and root lesion. Some nematodes are beneficial (for instance entomopathogenic nematodes are used in insect control).

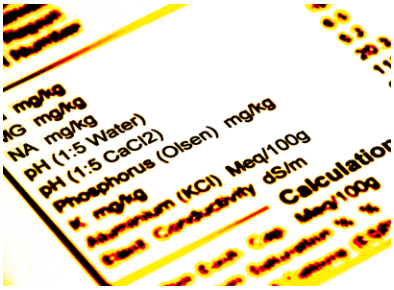
Off Label Use
The law requires that all agricultural and veterinary chemical products sold in Australia be registered by the Australian Pesticides and Veterinary Medicines Authority (APVMA). In most States, registered products must only be used for purposes that are specified on the label. In practice, situations often arise where chemicals are needed for a use not specified on the label. These are often termed 'off-label' uses. The APVMA can consider applications for permits that allow for the legal use of chemicals in ways different to the uses set out on the product label. In certain circumstances, the limited use of an unregistered chemical may also be allowed by permit.
Source: www.apvma.gov.au

Overseeding
The process of applying seed to an established turf surface. This is often carried out in transitional climates to provide colour and improve surface playability over the winter months when the dominant turf cover goes into dormancy. A common example is oversowing ryegrass (a cool-season turf variety) into couchgrass (a warm-season variety). The ryegrass provides a temporary cover over the cooler months and come spring will transition out as temperatures increase and growing conditions become more favourable for couchgrass.



Pathogen
A disease-producing agent usually applied to a living organism. Generally, any viruses, bacteria, or fungi that cause disease, with fungal pathogens most common in turf management.

Pesticide
Any chemical or mixture used to control unwanted plant or animal life to protect desirable organisms. Pesticides is the general term used to describe herbicides, insecticides, nematicides (products which control nematodes), miticides (products which control mites) and fungicides.



pH
The measure of acidity or alkalinity of a solution (eg: soil, water). The pH of value of pure water is 7, acid solutions have a pH less than 7 and alkaline solutions have a pH greater than 7. Soil pH levels have a significant impact on the availability of essential plant macronutrients (N, P, K) and micronutrients (iron, manganese, copper and zinc). When the pH level of a soil is excessively low, often lime will be applied to increase the level.

Phytotoxicity
Phytotoxicity is a term used to describe the degree of toxic effect by a compound on plant growth. Such damage may be caused by a wide variety of compounds, including trace metals, chemicals and salinity. Phytotoxicity manifests itself in the discolouration of turf.

Plant growth regulator (PGR)
A plant growth regulator is an organic compound, natural or synthetic, which when present or applied in small amounts, results in a change in plant growth or development, without causing severe phytotoxicity. Turf response to PGRs can vary depending on species, environmental conditions, time of application and stage of plant development. PGRs may be used by superintendents to reduce mowing requirements and provide smoother and quicker greens.

***Poa annua* (wintergrass/annual bluegrass)**
A highly resistant and invasive annual or perennial cool-season turf variety. Annual bluegrass is technically a weed, but it is such a successful weed that in some putting greens it is maintained as the primary turf variety or as part of the greens turf composition (eg: *Poa annua*/bentgrass). On pure bentgrass greens, however, it is eradicated. *Poa annua* is particularly well adapted to low mowing heights and produces a prolific amount of seedheads which aids in its spread and proves difficult in its control.

Poa trivialis
A variety of bluegrass (a cool-season turf) which is used to oversow couchgrass greens to aid with winter colour and improve playing surface quality when the couch is dormant. 'Poa triv', as it is often shorted to, can produce one of the highest quality overseeded areas of any cool-season variety.

Recycled or reclaimed water
Non-potable water that has been treated to a certain level and used for golf course irrigation. Examples include Class A, B and C treated effluent, sewer mining. Treated effluent has been used for many years on Australian golf courses and in a 2006 AGCSA survey of golf courses using treated effluent there is about 6000 ML/annum used. Increasing salinity, sodium and bicarbonates are the often reported challenges in managing this water resource.

Re-entry period
The time from when you apply a chemical, until it is safe for you to go back into the treated area. If you want to go back into the treated area before this time, you must wear the safety equipment that is listed on label. *Source: www.apvma.gov.au*

Remnant vegetation
Remaining indigenous plant species. New golf course developments will often have the requirement to preserve stands of remnant vegetation.

Renovations
Turf management works scheduled at various stages throughout the year to improve the health and sustainability of turf surfaces (e.g.: coring, scarifying, topdressing). Renovations are designed to reduce thatch which if left to build up over time can cause a number of serious management issues. Excessive thatch can mean increased likelihood of disease, possible scalping by trying to achieve more green speed from wet surfaces and hydrophobic (water repellent) soil conditions developing over summer.

Ryegrass
A cool-season turf variety that is commonly used to oversow couchgrass fairways/sporting grounds in what are known as 'transitional' zones to provide winter colour. The ryegrass is then transitioned out come spring as warmer weather prevails. Ryegrass is best known for its rapid seed germination and establishment.

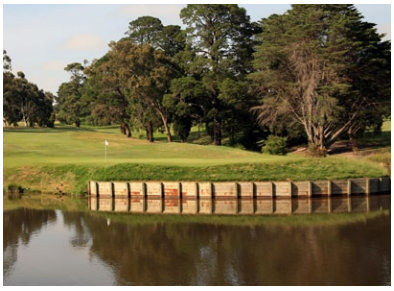
Salinity
The salt level contained in water or soil. Salinity is a key indicator of the quality of bore, dam, recycled or run off water used for irrigation. High-salinity water causes an increase in soil salts and as soil salinity increases it becomes more difficult for plants to extract water from the soil. As the impacts of widespread drought and water restrictions continue, many golf clubs are turning to alternative water sources, such as recycled effluent or groundwater, which can be relatively high in salts, sodium, chloride and bicarbonates.

Scarifying
The process of heavily renovating a turf surface to remove thatch accumulation and promote healthy regrowth. Scarifying is predominantly carried out on golf course fairways and tees and to a lesser extent on greens due to the disruption this practice can cause.

Sprigging
A method of vegetative planting by placing of sprigs in furrows or small holes or broadcast from a spreader and then rolled into the surface.

Stimpmeter
A device used to quantify green speed to ensure consistency across all greens. The stimpmeter is a 91.5cm (36-inch) extruded aluminum bar with a grooved runway on one side. A notch in the runway is used to support a golf ball until one end of the stimpmeter is lifted to an angle of roughly 20 degrees. The putting speed is measured after three balls are released in two directions and the distances travelled averaged.

Stolon
An elongated, jointed, above-ground creeping plant stem that can produce roots and shoots. Couchgrass is an example of a turfgrass variety which produces stolons to grow and spread.



Stormwater harvesting
The process by which stormwater/run off from the area surrounding a golf course is collected and stored for use as irrigation water. Stormwater harvesting requires accessibility to a large storm water main, constructing a reasonable sized holding basin on the storm water drain and a very high volume pumping system to capture as much of the flow as possible. Storm water occurs in short and intense events and the key is the ability to transfer as much of that water as possible.

Sustainability
The objective of golf course management that meets the present needs of the course and the environment without compromising the ability of future generations to meet their needs. The term sustainability has become a critical focal point for the golf industry in recent years, more than ever before. Climate change, weather extremes, the recent global economic downturn and environmental pressures have all brought about new challenges for golf clubs to maintain the high standards of course presentation which golfers have come to expect.

Syringing
The spraying of water in small amounts to cool the leaves, prevent wilt or to remove dew or frost. Syringing is often carried out during high-temperature stress periods. Cool-season turf varieties such as *Poa annua* and bentgrass are the two species that are usually treated with syringing, but any turf species under high-temperature stress can benefit from the procedure.

Tank mixing
The mixing of two or more chemicals/pesticides in the spray tank at the time of application. Superintendents will often mix compatible products to improve efficacy of the product(s) and reduce water usage and application time.

Thatch
The intermingled layer of living and dead grass stems, roots and other organic matter that is found between the soil surface and the leaf blades. Intensely managed turfgrass areas (such as putting greens) can often develop this organic layer which if left to build up over time can create serious agronomic issues for the playing surface. As well as causing a range of turf management issues, excessive thatch can be frustrating from a golfing perspective as it leads to increased ball marking, foot printing and inconsistent ball roll.

Threshold levels
The number or amount of pest activity tolerable before chemical intervention is deemed necessary.

Tining
The process of using either hollow or solid tines to remove vegetative matter from a turf surface or reduce soil compaction.

Topdressing
A heavier application of sand or soil to fill core holes and/or restore surface levels. The practice of topdressing dates back to the earlierst days of golf course management and is one of the most important cultural practices that goes into the maintenance of high quality turf surfaces. There are two basic approaches to topdressing. The first is to combine with with a core aerification programme and the second is to undertake a regular 'dusting' programme.

Turf Registered Product
Chemicals registered for use on turf have undergone years of rigorous testing, often at an investment in the millions of dollars, to ensure they are suitable for their intended use. As a result, manufacturers of turf registered products provide a warranty when they are used in accordance with label directions.

This results in turf registered products being priced to reflect the investment in the testing and registration process, but provides turf managers with an assurance of a product's quality and efficacy when used as directed. *Source: www.apvma.gov.au*

Warm-season turfgrass
A heat-tolerant turfgrass species best adapted to growth during the warmer months of the year and usually dormant during colder weather, commonly having a temperature optimum between 27-35°C. Examples include couchgrass, kikuyu and seashore paspalum.

Water Management Plan
A water management plan identifies the works and practices that will improve irrigation and water use efficiency for the golf course. A water management plan will assess current water management practices, secure future water availability through sustainable practices and demonstrate environmental responsibility. It is important to undertake a water management plan because it provides a concise assessment on all the activities related to golf course water use.

Weed
A plant considered undesirable, unattractive, or troublesome, especially one growing where it is not wanted. Weeds can be removed either through chemcial control or by cultural means (e.g.: mowing).

Wetting agent (also called surfactant)
A surface-active substance that reduces interfacial tensions and causes spray solutions or suspensions to make better contact with treated surfaces.

Vertical mowing (also called verti-cutting)
A term used to describe equipment with rapidly spinning vertical blades. Vertical mowers are generally used on golf greens and other high maintenance turf surfaces where they are set to lightly groom the surface to prevent grain, a condition where the grass blades lie in a single direction and affect ball roll.

AGCSA

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