

Cactus Clippings

2013 OCTOBER/NOVEMBER

SPECIAL POINTS OF INTEREST:

- White Mountain Get Away Update
- October, November & December Forecast, Moon Phase, Sunset, Sunrise Calendars

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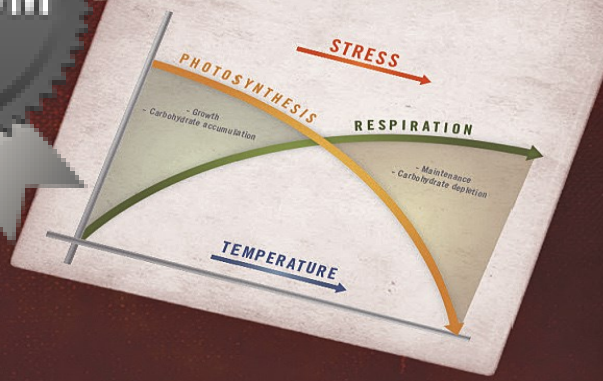
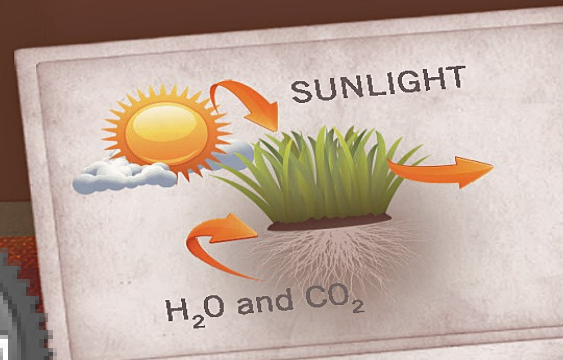
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President's Letter ~ Dan Cramer

I hope everyone has had a successful summer. This season has been one of the most unusual seasons that I can recall. Mother Nature kicked off May with some unusually high temperatures mixed in with a little rain at the end of the month. This was followed up with a record setting "cool" June only to be followed up by a record setting "hot" July. Mother Nature, staying consistent with the wacky weather patterns of 2013, denied us the monsoon rains and relief we look forward to each July and August. This winter may continue the bizarre weather patterns with the talk of El Nino setting up in the Pacific. Hopefully our weather patterns will return to normal so we all can get through over seeding with no major obstacles.

Our White Mountain Getaway was a welcome relief to get to the cool pines of Pinetop and escape the intense heat of the Valley. It is great to see all the kids running around having a good time and the food was absolutely delicious. We were very fortunate to be able to play the premier course in the White Mountains and the participation reflects this. The registration numbers for golf and the BBQ were at an all time high for this event. There were over 130 individuals in attendance for the Pizza Party, Fiesta and the BBQ. I would like to thank Doug Dykstra CGCS, Golf Superintendent at White Mountain Country Club for hosting the golf Monday. The golf course was fun to play and as always was in great shape. This was not easy to do, given that Mother Nature has given this area more summer rains than they normally receive. The golf course reflected their professionalism, dedication and hard work they put into their courses on a daily basis. We have received many positive comments from those in attendance about the golf course and the BBQ. I would like to extend a thank you to the Affiliates who helped sponsor this event and to Carmella and her volunteers who spent many hours taking care of all the arrangements that go into making this event a success. We could not do this without their support and help.

Next year we are proposing that we change our White Mountain Get Away to June, June 20th through June 23rd, 2014. Hopefully to get more of our Members and their families to join us. Please let us know your thoughts.

Your Board and Committees continue to work hard. One main item being addressed is the Office of Pest Management to the Department of Agriculture change over. Carmella currently serves as Chairperson for the Pest Management Advisory Committee for the Office of Pest Management. The role of the Advisory Committee is to act as a voice of the Pest Management Industry and provide recommendations and technical advice to the Acting Director. A couple of other areas that we're concentrating on is the Future of Water in Arizona and Air Quality issues.

I hope the upcoming overseed season is successful and uneventful for everyone. Please remember to support our Affiliates who support Cactus and Pine, GCSA.

Dan Cramer ~ Board President



Hello all, I would like to introduce myself as the new Assistant Superintendent Liaison to the board of directors for the Cactus and Pine. I have been at TPC Scottsdale for a little over a year and a half and made the move to the valley of the sun from Pebble Beach Golf Links in Pebble Beach California. I look forward to working closely with the next generation of golf course superintendents. Some of my goals while serving on the board are to improve participation from Assistant Superintendents throughout the Cactus and Pine and find new opportunities for assistants to educate themselves as we prepare to take the next step in our careers. Through networking and open lines of communication I believe that as a team we will be able to not only improve our own career paths but the turf industry as a whole. The first agenda item I have is to contact all of you and find ways that you feel I can improve the value of the Cactus and Pine for the Assistant Superintendent. I look forward to hearing from all of you and wish you the best of luck in overseed and the winter months.

Bubba Wright, Assistant Superintendent TPC Scottsdale
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Fairway Overseeding Trials 2012-2013 University of Arizona.

By: D. M. Kopec, J. Gilbert, M. Pessaraki, E. Sanchez and D. A. Kilmer University of Arizona.

Introduction

Most golf course and year round sports turf facilities overseed bermudagrass with a cool season turf species in the early Fall in order to provide an actively growing green surface on a nearly year-round basis. Perennial ryegrass is the most commonly used species while intermediate hybrid ryegrasses are increasing somewhat in use. Annual ryegrass was traditionally used on home lawns and commercial properties but, more recent improvements in annual ryegrasses have demonstrated improved turfgrass performance at lower mowing heights (5/8"). Fine fescues are sometimes included in seed mixtures with ryegrass, usually in years when carryover and seed inventories are high. An ideal "overseed season" includes a condition where, other things being equal, the overseed grass exhibits quick emergence and cover, maintains consistent inherent color during times of repeated freezing low temperature events, maintains consistency in leaf texture throughout the Spring months, has a moderately low growing habit, and yields "early" to bermudagrass without the exhibition of excessive "straw" from necrotic tissue. These multiple factors were assessed in these trials.

Materials and Methods

The bermudagrass overseed was a 15 year old stand of Tifway 419 bermudagrass, mowed year round at 5/8". Each entry appeared four times in the test. Seeding rates for ryegrass species was 625 lbs PLS/ACRE, with mixtures overseeded at provider specified rates. The test was overseeded on October 19th 2012. Data collected included establishment cover, percent bermudagrass in late spring and early summer, as well as turfgrass color, quality, density and texture using the NTEP scale system. Percent plot straw was included in the spring transition data. In this report, turfgrass color, turfgrass quality, and spring transition are included, which are major items of concern for fairway golf turf. For a full report, please contact me at dkopec@ag.arizona.edu !

Results and Discussion

Turfgrass Color:

Turfgrass color scores ranged from 3.5, to 8.0 across all entries, from Dec 3rd to May 13th, and from 2.5 to 7.3 from June 13th to June 30th at transition time (Table 1). Mixtures 1, 2, 3 and 4 had color scores for the year which ranged between 4.4 to 5.5. Entries which were generally light in green color were Solstice II intermediate ryegrass (4.8 to 5.5 from Dec to May); Mixture 1 (4.3 to 5.0 from Dec to May); Mixture 3 (4.0 to 5.8 from Dec to May); and Breakout annual ryegrass (4.5 to 5.3 from Dec to May) (Table 1).

Entries with darker genetic color included PPg-pr-168 (6.5 to 7.8 from Dec to May); all three B-12 series perennial ryegrasses (6.0 to 8.8 from Dec to May); 1202 ryegrass (6.5 to 8.0, from Dec to May); and PhD9 (6.5 to 8.0, from Dec to May). Prosaline pr/Celestial fine fescue mixture was slightly darker in color (6.5 to 7.8 from Dec to May, while Prosaline pr/Maritima alkali saltgrass mixture ranged from 6.3 to 7.3. Both of these entries had fully acceptable turfgrass color. APR 2525 averaged (6.3 to 8.0, from December to May).

During transition on July 2nd, color scores ranged from 3.8 (Solstice II intermediate ryegrass) to 7.0 (1202 perennial ryegrass (Table 1). Seasonal mean color values ranged from 4.4 to 7.5 for color. Note that the general trend for darker ranking color scores occurred firstly for and among the perennial ryegrasses, followed by ryegrass blends, then by species mixtures and then by annual ryegrasses.

Turfgrass Quality:

Overall quality is the single value assigned for overall appearance in terms of density, ground cover, smoothness, leaf texture and consistency for "within plot" color. Absolute color should not affect the individual quality score. Quality during the normal season should include minimal values of 6.0, from Dec to the end of May (Table 2). Transition is taking place by 1 June, and quality observations on July 2nd are thus included with the interpretation of transition data itself. A quality index (Q.I.) was devised as the sum of events when an individual entry has a "quality mean" of 6.5 or more, plus the number of events that the quality mean score is 7.0 or more, plus the number of times a quality mean was 8.0 or more. The summation of these event occurrences is the Q.I. value itself.

Quality seasonal averages ranged from 4.7 for Mix #1, to 7.4 for Saltinas which was followed closely by both PPg-pr-168 and PPg pr – 140 (both at 7.3). Breakout annual ryegrass had a season long quality average of 5.3, with a Q.I. of 2. Solstice II hybrid ryegrass vacillated in quality from December to May, and had low quality scores during transition, due to the high percentages of percent plot straw present (23%) (Table 3). Mixtures 3 and 4 were slightly better in quality than Mixtures 1 and 2, throughout the trial.

Quality Index (Q.I.) values ranged from 0 for (five overseed entries) to high Index values of 20, for both PPg-pe-168 (pr) and Saltinas (Table 2). Other entries which ranked close included PPg-pr-140 (Q.I.=18), PhD 4 (Q.I.= 18), ProSaline Maritima mixture (Q.I. =17), PhD9 blend (Q.I.= 17), and 1202 (pr) (Q.I. = 16). The B-12 perennial ryegrass series ranged from 10-14 for Q.I. Index .

Transition from overseed back to bermudagrass:

Percent plot bermudagrass was assigned to plots on June 13 and July 2nd. Test means were 36% and 71% bermudagrass on those dates respectively. On June 13th Mixture 4 has the most bermudagrass at 64%, followed by Solstice II hybrid ryegrass which had 60% bermudagrass cover (Table 3) Entries which followed next included Mixture 3 (48%), Mixture 2 (46%), B-12 1205 (pr) (43%), B-12 1209 (pr) (40%) and Breakout annual ryegrass (40% bermudagrass) (Table 3). Note that Breakout annual ryegrass had significant amounts of straw on June 13th and July 2nd (24%, 23%), while Mixture 4 had low amounts of straw (13%, 5%) respectively. Mixture 1 had large amounts of straw present on June 13th (36%). In contrast, B-12-1205 and B -12-1209 had essentially no straw present (Table 7).

On July 2nd, percent plot bermudagrass ranged from 39% (PhD 9 blend) to 87% (Mixture 2) (Table 3). Note that the amount of bermudagrass in the annual Breakout and the hybrid Solstice II did not have the most amount of bermudagrass present (69-76%) as there were other entries of perennial ryegrass which had more bermudagrass plot cover on July 2nd. These included B -12-1205 (84%), Mixtures 1,2, and 4 (80, 87 84% respectfully). Note also that mixtures 1,2 and 4 had 13-36% straw cover on June 13th, and 5-15% straw cover on July 2nd. Entries which had larger amounts of bermudagrass without excessive straw included B-12-1205 (84% bermudagrass, 1% straw), APR 2225 (76%bermudagrass and 0% straw), PhD4 blend (66% bermudagrass and 3% straw). Again, Mixtures 1,2 and 4, as well as Breakout annual ryegrass and Solstice II hybrid had considerable straw present on June 13th, July 2nd, or both.

Note that the turf remained at 5/8” inch throughout the entire trial. Extra nitrogen and lower mowing heights (3/8” or lower) were not implemented in order to avoid any physiological (nitrogen) or mechanical (low mowing) bias in lieu of allowing for the full genetic expression of spring/summer decline. That being the case, B-1205 (pr) did produce a turf with above average seasonal quality (6.8), minimal straw (1%) and a seamless transition with 84% bermudagrass on July 2nd. Other entries had similar amounts if bermudagrass on July 2nd, but not without lower overall turfgrass quality due to co-development of necrotic tissue (straw) in the process.

Quality and Transition Together:

Entries which had acceptable quality on each evaluation date (including the final two transition dates), as well as a strong transition back to bermudagrass included B-12- 1205 perennial ryegrass (84% Bermuda on July 2nd, 1% straw and a seasonal quality mean of 6.8 and a Quality Index of “14”). APR 2225 had 76% bermudagrass, 2% straw a seasonal quality average of 6.9, and a Q.I., of “15”.

Saltinas perennial ryegrass had a seasonal quality mean of 7.4 and a Q.I. of “20”, but had less Bermuda than the overall test mean on both June 13th and July 2nd. Mixtures 1,2 and 4 had effective transitions, but produced excessive amounts of straw at some point and had seasonal quality means of less than 6.0. The same was true for Solstice II hybrid ryegrass.

Other entries had high amounts of bermudagrass present on July 2nd, but also had lower quality scores due to the inclusion of larger amounts of straw present. Other entries had high quality performance throughout the entire trial, a large Q.I. Index value (Saltinas, PPg-pr-168, PPg-pr-140, PhD4), but were slower in transition than B-12-1205.

Entry B-12-1205 did produce a seamless transition. It had a high turnover to bermudagrass (84%bermudagrass , a trace of straw (1%) and above average turfgrass quality on all evaluation dates, including the transition period. B-12-1205 had a season long quality average of 6.8.

Table 1. Mean turfgrass color scores for overseed entries

2012 2013 fairway overseed trials, 2012 2013. University of Arizona

trt	Composition	Color ¹										Season
		Dec 3	Dec 13	Jan 13	Feb 20	Mar						Avg. ²
						26	Apr 2	Apr 20	May 27	June 13	July 2	
1	Mix 1	3.5	4.3	4.8	4.8	4.5	4.8	4.8	5.0	2.5	4.8	4.4
2	Mix 2	4.8	5.0	5.5	5.5	5.8	6.0	5.5	5.5	3.8	5.0	5.2
3	Mix 3	4.0	4.3	5.0	4.8	5.3	5.3	5.0	5.8	5.0	6.3	5.1
4	Mix 4	4.8	5.3	5.8	5.5	5.8	6.3	5.8	6.0	4.5	5.3	5.5
5	PPg-pr-168 (Pr)	6.5	6.8	7.8	6.8	7.8	7.8	7.3	7.3	7.0	5.8	7.1
6	Breakout arg (Ar)	4.5	5.0	5.3	5.0	4.8	5.3	5.0	4.8	2.8	4.5	4.7
7	PPg-pr-140 (Pr)	6.3	6.5	7.3	6.8	7.3	7.0	7.5	7.5	6.3	6.0	6.8
8	Solstice II (Hyb)	4.0	4.8	5.3	4.8	5.3	5.3	4.8	5.5	3.0	3.8	4.6
9	B-12.1205 (Pr)	7.0	7.5	8.5	7.8	7.8	7.8	8.0	7.5	6.8	6.0	7.5
10	B-12.1206 (Pr)	6.8	7.3	8.8	8.0	8.8	7.8	7.3	7.5	6.5	6.8	7.5
11	B-12.1209 (Pr)	6.0	7.0	8.0	6.8	7.5	7.3	6.5	7.5	6.5	6.3	6.9
12	945X (Pr)	5.5	5.5	6.5	6.8	6.8	6.5	6.3	6.0	5.5	5.8	6.1
13	1201 (Pr)	6.5	5.8	7.0	6.5	7.3	7.3	6.3	7.0	6.3	6.0	6.6
14	1202 (Pr)	6.8	6.8	7.8	7.5	8.0	8.0	6.5	7.5	6.8	7.0	7.3
15	Saltinas (Pr)	6.3	6.3	6.5	6.5	6.5	7.0	6.5	7.3	6.3	6.5	6.6
16	Prosaline (Pr)/Celestial red fescue	7.0	6.5	7.8	7.0	7.8	7.8	7.5	7.8	6.3	6.3	7.2
17	Prosaline (Pr)/Maritima) (As)	6.3	6.8	6.5	6.8	6.3	6.3	6.8	7.3	6.0	6.3	6.5
18	Apr-2225 (Pr)	6.3	6.5	7.8	7.0	8.0	7.8	7.3	7.5	6.5	6.5	7.1
19	PhD 2 (Pr blend)	3.8	3.8	5.0	5.0	5.3	5.5	5.3	4.8	4.5	4.5	4.7
20	PhD 4 (Pr blend)	5.8	6.5	7.5	6.8	8.0	7.5	7.0	7.5	7.3	6.5	7.0
21	PhD 6 (Pr blend)	6.3	6.0	7.5	6.8	7.8	7.5	6.8	7.0	6.3	6.5	6.8
22	PhD 9 (Pr blend)	6.5	6.3	7.3	7.0	8.0	7.8	7.0	7.3	6.8	6.3	7.0
23	Non-seeded Check	.	1.0	2.0	1.0	3.0	4.3	3.3	5.3	5.8	6.0	3.5
	Test mean	5.7	5.7	6.6	6.1	6.6	6.7	6.2	6.6	5.6	5.8	6.2
	LSD	1.0	0.9	0.8	0.8	0.7	0.9	1.1	0.8	1.0	0.8	0.4

¹ Color = (1-9). 1= dead, 4= yellow green, 5= pea green, 6=green, 9=forest green. Values are the mean of 4 replications.

² Season avg. = Grand mean of all evaluation date means.

³ Test mean = mean of all treatments and non-seeded check on that date event.

⁴ LSD Value = treatment mean comparison statistic. Absolute value differences between two treatments, when greater than the LSD value, denote statistical difference between treatments.

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Strategies for Nutsedge Control in Turf ~ By Kai Umeda

Since my last article about nutsedge control four years ago, a few things can be improved in the battle to control the “world’s worst weed”. I’ve modified my June 2009 article slightly to update the strategies to reduce nutsedge in turf. On the regulatory front, the use of MSMA (monosodium methylarsonate) on golf courses, sod farms, and highway rights of way may be allowed to continue indefinitely. The use pattern on turf was to be discontinued after December 31, 2013 following reviews of the product; however, the reviews were not completed so its use will continue to be allowed. MSMA has NOT been permitted for use on residential turf since December 31, 2010.

The directions for using MSMA on golf courses allow only one broadcast application on newly constructed courses. Applications on existing courses are limited to spot treatment (100 sq ft per spot), not to exceed 25% of the total course in one year. On sod farms, two broadcast applications are allowed per crop. A 25 foot buffer strip is required for fields bordering permanent water bodies.

The U.S. EPA agreement limiting MSMA use and casting uncertainty for the future will alter the approach to controlling nutsedge economically in turfgrasses in the desert for the long-term. MSMA has been an inexpensive tool for initiating purple nutsedge control when it first emerges in turf during the spring through early summer. It causes rapid foliar chlorosis followed by desiccation. MSMA has no preemergence soil activity and requires multiple applications for the newly emerging nutsedge. These continuous applications before the summer solstice should begin exhausting the underground tubers of carbohydrate reserves as they spend energy to constantly put out new shoots that get burned down by the MSMA.

Another herbicide to consider for replacing MSMA may be the use of Dismiss CA* (sulfentrazone) that causes somewhat similar nutsedge leaf burning when applied postemergence. The duration of the resultant burndown can last 7 to 14 days but in tandem with constant low mowing, nutsedge populations can be stressed.

Following the early season applications of MSMA and Dismiss CA along with mowing, at the end of June and around the 4th of July holiday, the highly effective ALS-inhibiting (acetolactate synthase enzyme) herbicides can begin to be applied for postemergence control of the purple nutsedge. The commercially available ALS-herbicides that control nutsedge are SedgeHammer* (halosulfuron), Image* (imazaquin), Monument* (trifloxysulfuron), Certainty* (sulfosulfuron), and Katana* (flazasulfuron) (Table). Newer combination herbicide products can be included at this timing of application – Tribute Total* (halosulfuron plus foramsulfuron [Revolver*] plus thiencazzone) and Dismiss South* (sulfentrazone plus imazethapyr). Imazethapyr is a related herbicide in the same family as Image. The timing of applications of these herbicides takes advantage of the shortening day-lengths when it is expected of perennial weeds to begin translocating photosynthates to the developing tubers. The ALS herbicides effectively penetrate the foliage and move to the developing tubers and prevent their further maturation. Results of several nutsedge control experiments conducted with these products are available in the University of Arizona College of Agriculture and Life Sciences annual publication Turfgrass, Landscape and Urban IPM Research Summary (<http://turf.arizona.edu>).

The “1-2 punch” of MSMA/Dismiss CA followed by an ALS-herbicide should effectively begin to reduce purple nutsedge populations in turfgrasses. Of course, the degree of the infestation and turf management practices contribute to the level of control achieved. A thick and high population of nutsedge and high soil moisture content will make it more challenging to reduce the infestation. Generally, most of the herbicide labels recommend a sequential application at 4 to 6 weeks after the first application. SedgeHammer and Image might provide only 2 to 4 weeks of control and then needing a second application. Monument, Katana, and Certainty have given longer intervals beyond 4 to 6 weeks. The July followed by a second mid-August application of ALS-herbicides should reduce nutsedge going into the fall overseeding season. Repeat the same program of MSMA/Dismiss CA plus mowing followed by only two July-August ALS-herbicide applications in subsequent summers until manageable and acceptable levels are achieved.

Limiting ALS-herbicides to only two summertime applications for nutsedge control will reduce the chances of purple nutsedge developing resistance to the class of herbicides. Switching among the brands of ALS-herbicides and increasing the number of seasonal applications is targeting the same sites for the same modes of herbicide action and result in lesser nutsedge control. Additionally, do not expect some of the ALS-herbicides (also commonly referred to sulfonyleurea [SU] herbicides) such as Monument or Katana to control nutsedge when applied at lower rates to remove overseeded ryegrass during spring transition. The sub-lethal dose for nutsedge control will contribute to the chance of herbicide resistance development.

The MSMA/Dismiss CA followed by ALS-inhibiting herbicides is an effective strategy of multiple postemergence applications when used in combination with low height of cut and frequent mowing. Preemergence herbicides generally offer better yellow nutsedge control. Penant Magnum* (s-metolachlor) and Tower* (dimethenamid) generally will not provide acceptable control of purple nutsedge. Dismiss CA and several other pre-mix products that contain sulfentrazone - Surge*, Q-4Plus*, and Solitare* might offer better yellow nutsedge suppression or reduction. These sulfentrazone-containing products may only cause temporary and slight burning of nutsedge foliage

*Product names mentioned are registered trademarks. Any products, services, or organizations that are mentioned, shown, or indirectly implied in this publication do not imply endorsement by The University of Arizona.

Table. Herbicides for Nutsedge Control in Turf

Sedge-Hammer* halosulfuron 75 WG	Tribute Total* halosulfuron + foramsulfuron + thien-carbazon 60.5% WDG	Monument* trifloxysulfuron 75 WG	Certainty* sulfosulfuron 75 WDG	Image* imazaquin 70 DG	Katana* flazasulfuron 25 WG	Dismiss South* sulfentrazone + imazethapyr 4SC	Dismiss CA* sulfentrazone 4 SC
0.062 lb a.i./A		0.025 lb a.i./A	0.06 lb a.i./A	0.5 lb a.i./A	0.047 lb a.i./A		0.375 lb a.i./A
1.3 oz prod/A	3.2 oz prod/A	0.53 oz prod/A	1.25 oz prod/A	11.5 oz prod/A	3.0 oz prod/A	9-14.4 oz prod/A	4-12 oz prod/A
Limit not stated	Limit of 6.4 oz/A per year	Limit of 1.7 oz/A per year	Limit of 2.66 oz/A per year	Limit not stated Add MSMA	Limit 9 oz/A per year	Limit not stated	Limit of 12 oz/A per 12 months

2013 Cactus & Pine Holiday Party

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DATE:
SATURDAY, DECEMBER 14th, 2013

LOCATION:
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623-876-3050 TIME: 5:00 PM - 8:00 PM



Santa will be there (from 5:30 pm - 7:30 pm) for all of the children, giving them a gift,
*(Hopefully off of their "Dear Santa Letter",
 We need a little assistance from you in this matter!)*
 There will also be children's entertainment and lot's of crafts.

Please Put this date on your calendar & RSVP with us at your earliest convenience. You know what they say the more the merrier! Call 480-609-6778, fax 480-348-5976 or e-mail: carmella@cactusandpine.com

IT'S NEVER TOO EARLY TO PLAN YOUR HOLIDAY CALENDAR! We would REALLY appreciate your responses by Friday, November 29th, especially if you have children accompanying you, We need their gift requests for Santa!





**Having A Great Day Golfing at
White Mountain Country Club with
Host, Doug Dykstra, CGCS**





Summer Transition Field Work ~

By Brandon Williams, GCS, Corte Bella Golf Club

Upon relocating from the Pacific Northwest to the Phoenix area as a 2nd Assistant in 2004, I had very little knowledge of warm-season turfgrass management and the process of overseeding and summer transition. After completing my first cycle of this process and realizing the amount of time, planning and resources it took for it to be successful for our golf course, I felt overwhelmed. It is incredible what we all go through to produce excellent conditions. I knew the only way for me to learn was to seek help and advice from surrounding peers, mentors, and educators. In my first year in Arizona, it was amazing to see the process at my golf course, coming from the Northwest, but it was even more amazing to see that every golf course has a different approach to the overall scheme. Fast forward nearly 10 years, after many trials and tribulations, I have realized we still all utilize different methods and strategies. But that is a good thing, and has been for me too. It is a great opportunity to learn from the best and help develop my own strategies as a Superintendent at the different courses I have managed.

After conducting several experiments at my previous course in the mid 2000's with Kai Umeda of the University of Arizona and Brian Whitlark, now USGA, I once again called upon Kai seeking advice and expertise. I am in my 2nd year at Corte Bella in Sun City West, and in my 2nd summer of using chemical transition aids for ryegrass removal at our golf course. The number one goal in my mind was to find ways to improve our transition for Corte Bella members and guests. I know, from many recommendations, that it is wise to seek a minimum of 100 days of complete bermudagrass growth without ryegrass competition before fall overseeding. So that means by Fathers Day, if you choose to overseed in late September or early October, the ryegrass must be gone. From the information we already knew, Kai and I decided to evaluate different options.

Kai came to Corte Bella and made several test applications of different transitional herbicides in early May, and we decided our goal was to evaluate the timing and rates of these products with the hopes of finding a slower method of ryegrass removal versus the complete total kill of 10-12 days. In 2012, we had ryegrass removal in that 10 to 12 day time frame when applied just after Memorial Day. Of course, as expected, June was a rough month as we fought to fill in our 419 bermuda. By having Kai come to Corte Bella and complete this study, the amount of light shed and the amount of experience gained was tremendous. We realized that by applying several different products at specific dates, say early May, we might be able to lightly stress and slow the rate of ryegrass removal, provide the bermudagrass more resources to fill in, and hopefully encourage a more seamless transition. Kai held an excellent demonstration day in early June to show off our plots for those interested, and it was a great opportunity for me to share my personal experiences from my current and previous facilities. Not only was I more informed from our work on the test plots, but it also was a great day to share information and experiences and compare results and procedures with other turf managers.

By using this experience gained, I will be able to tweak my current program for 2014 with more confident decisions and better results. Of course, you can never have enough communication with your members/guests and it appears that Corte Bella members have a better understanding of my program. They may not like thin bermuda fairways, but I am confident that they are more aware, and by utilizing the help of Kai and by seeing the field work for themselves, they are more appreciative of our goals and dedication. I'd encourage you to share your experiences and use your course for educational purposes as it has been a great help for me.

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Cactus & Pine Golf Course Superintendents Association Supports Yarnell Fire Fundraiser ~ By Jeff Jensen, GCSAA

More than \$130,000 raised for the families of 19 firemen lost in Arizona wildfire

The Cactus & Pine Golf Course Superintendents Association donated \$1,000 and its members volunteered their time at an Aug. 2 golf fundraiser to assist families of the 19 brave firefighters that perished in the tragic Yarnell Hill wildfire in Yarnell, Ariz., June 30.

The fire, ignited by lightning, June 28, overran and killed the firefighters with the Prescott Fire Department's interagency Granite Mountain Hotshots. It is the sixth deadliest American firefighter disaster and the deadliest wildfire ever in Arizona.

The fundraiser, organized by the Southwest PGA Section and assisted by a number of allied golf organizations including the Cactus & Pine GCSA, was conducted at Gainey Ranch Golf Club in Scottsdale. More than 100 participants turned out to honor the fallen heroes.

"Our members are honored to provide financial support and volunteer assistance to such a great cause," said Cactus & Pine GCSA executive director Carmella Ruggiero. "The Granite Mountain Hotshots are true heroes and gave their lives to protect the citizens of Arizona and it's terrific to see the allied golf associations come together and contribute to the families of the fallen."

The event raised nearly \$108,000 and all contributions go to the Arizona 100 Club to be distributed to the families of the firefighters who were affected.

"The association has a long history of helping those in need," said Damien Smith, GCSAA Class A superintendent at Gainey Ranch Golf Club and Cactus & Pine GCSA board member. "We recognize the financial and emotional support that the wives, children and other family members of the fallen need during this difficult time and our members are glad to step up and assist in any way possible. We want to honor and remember those who gave all in the line of duty." For more information on how to contribute to the Granite Mountain Hotshots Crew, visit www.heroesmemorial.org



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Cactus & Pine Mission Statement

**The Cactus & Pine Golf Course Superintendents Association
Is dedicated to serving its Members by enhancing their
recognition as professionals, by educating Members
Concerning efficient and economical management of golf
courses and related environmental standards and by
Providing collaborative ways for Members to assist and
help one another**

Cactus & Pine 2013 Annual Meeting at Gainey Ranch.

This Beautiful Ice Craving was donated by Damien Smith, GCS

Should You Buy or Lease Your Next Vehicle?

	Buying considerations	Leasing considerations
Ownership	When the vehicle is paid for, it's yours. You can keep it as long as you want, and any retained value (equity) is yours to keep.	You don't own the car--the leasing company does. You must return the vehicle at the end of the lease or choose to buy it at a predetermined residual value; you have no equity.
Monthly payments	You will have a monthly payment if you finance it; the payment will vary based on the amount financed, the interest rate, and the loan term.	When comparing similar vehicles with equal costs, the monthly payment for a lease is typically significantly lower than a loan payment. This may enable you to drive a more expensive vehicle.
Mileage	Drive as many miles as you want; a vehicle with higher mileage, though, may be worth less when you trade in or sell your vehicle.	Your lease will spell out how many miles you can drive before excess mileage charges apply (typical mileage limits range from 12,000 to 15,000).
Maintenance	When you sell your vehicle, condition matters, so you may receive less if it hasn't been well maintained. As your vehicle ages, repair bills may be greater, something you generally won't encounter if you lease.	You generally have to service the vehicle according to the manufacturer's recommendations. You'll also need to return your vehicle with normal wear and tear (according to the leasing company's definition), so you may be charged for dents and scratches that seem insignificant.
Up-front costs	These may include the total negotiated cost of the vehicle (or a down payment on that cost), taxes, title, and insurance.	Inception fees may include an acquisition fee, a capitalized cost reduction amount (down payment), security deposit, first month's payment, taxes, and title fees.
Value	You'll need to consider resale value. All vehicles depreciate, but some depreciate faster than others. If you decide to trade in or sell the vehicle, any value left will be money in your pocket, so it may pay off to choose a vehicle that holds its value.	A vehicle that holds its value is generally less expensive to lease because your payment is based on the predicted depreciation. And because you're returning it at the end of the lease, you don't need to worry about owning a depreciating asset.
Insurance	If your vehicle is financed, the lien holder may require you to carry a certain amount of insurance; otherwise, the amount of insurance you'll need will depend on personal factors and state insurance requirements.	You'll be required to carry a certain amount of insurance, sometimes more than if you bought the vehicle. Many leases require GAP insurance that covers the difference between an insurance payout and the vehicle's value if your vehicle is stolen or totaled. GAP insurance may be included in the lease.
The end of the road	You may want to sell or trade in the vehicle, but the timing is up to you. If you want, you can keep the vehicle for many years, or sell it whenever you need the cash.	At the end of the lease, you must return the vehicle or opt to buy it according to the lease terms. Returning the vehicle early may be an option, but it's likely you'll pay a hefty fee to do so. If you still need a vehicle, you'll need to start the leasing (or buying) process all over.

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OCTOBER

THE TENTH MONTH • 2013

SKY WATCH ☆ *Saturn is getting quite low in the west, joining horizon-hugging Venus, which, though still a mere 10 degrees up in fading twilight, brightens to magnitude -4.5 this month. Green Uranus reaches opposition at magnitude 5.7 in Pisces on the 3rd. It's an easy target in binoculars and faintly visible to the naked eye in dark skies, especially during this moonless period. The thin crescent Moon hovers between Mercury and Saturn on the 6th, a low conjunction visible to southern observers. The Moon is to the right of Venus on the 7th and to the right of Jupiter on the 24th. The Giant Planet now rises by 11:00 P.M. and can be well observed after midnight.*

● New Moon	4th day	20th hour	35th minute
◐ First Quarter	11th day	19th hour	2nd minute
○ Full Moon	18th day	19th hour	38th minute
◑ Last Quarter	26th day	19th hour	40th minute

All times are given in Eastern Daylight Time.

Purchase these pages with times set to your zip code at MyLocalAlmanac.com.

Day of Year	Day of Month	Day of Week	☀		☀		Length of Day h. m.	Sun Fast m.	Declination of Sun ° ' "		High Tide Times Boston		☾		Set Key	Place	Age
			Rises h. m.	Rise Key	Sets h. m.	Set Key			Rises h. m.	Rise Key	Sets h. m.	Set Key					
274	1	Tu.	6:41	C	6:25	C	11 44	26	3 s. 26	9 1	9 1/2	3:09	C	4:30	D	LEO	26
275	2	W.	6:42	C	6:23	C	11 41	27	3 49	10	10 1/4	4:10	D	4:59	D	SEX	27
276	3	Th.	6:43	C	6:21	C	11 38	27	4 12	10 3/4	11	5:13	D	5:29	C	LEO	28
277	4	Fr.	6:44	C	6:20	C	11 36	27	4 35	11 1/4	11 3/4	6:17	D	5:59	C	VIR	0
278	5	Sa.	6:45	D	6:18	C	11 33	28	4 59	12	—	7:23	E	6:33	C	VIR	1
279	6	F	6:46	D	6:16	C	11 30	28	5 22	12 1/2	12 3/4	8:30	E	7:10	B	VIR	2
280	7	M.	6:48	D	6:15	C	11 27	28	5 44	1	1 1/4	9:38	E	7:53	B	LIB	3
281	8	Tu.	6:49	D	6:13	C	11 24	28	6 07	2	2	10:44	E	8:42	B	LIB	4
282	9	W.	6:50	D	6:11	C	11 21	29	6 30	2 3/4	3	11:47	E	9:38	B	OPH	5
283	10	Th.	6:51	D	6:10	C	11 19	29	6 53	3 1/2	3 3/4	12:45	E	10:40	B	OPH	6
284	11	Fr.	6:52	D	6:08	C	11 16	29	7 15	4 1/2	4 3/4	1:36	E	11:46	C	SAG	7
285	12	Sa.	6:53	D	6:06	C	11 13	29	7 38	5 1/2	6	2:20	E	—	—	SAG	8
286	13	F	6:54	D	6:05	C	11 11	30	8 00	6 3/4	7	2:59	E	12:54	C	CAP	9
287	14	M.	6:56	D	6:03	C	11 07	30	8 23	7 3/4	8	3:35	D	2:04	C	CAP	10
288	15	Tu.	6:57	D	6:01	B	11 04	30	8 45	8 3/4	9	4:08	D	3:12	D	AQU	11
289	16	W.	6:58	D	6:00	B	11 02	30	9 07	9 1/2	10	4:40	C	4:21	D	PSC	12
290	17	Th.	6:59	D	5:58	B	10 59	31	9 29	10 1/2	11	5:11	C	5:28	E	PSC	13
291	18	Fr.	7:00	D	5:57	B	10 57	31	9 51	11 1/4	11 3/4	5:44	C	6:33	E	PSC	14
292	19	Sa.	7:01	D	5:55	B	10 54	31	10 12	12	—	6:20	B	7:38	E	ARI	15
293	20	F	7:03	D	5:54	B	10 51	31	10 34	12 1/2	12 3/4	6:58	B	8:40	E	ARI	16
294	21	M.	7:04	D	5:52	B	10 48	31	10 55	1 1/4	1 1/2	7:39	B	9:39	E	TAU	17
295	22	Tu.	7:05	D	5:51	B	10 46	31	11 16	2	2	8:25	B	10:34	E	TAU	18
296	23	W.	7:06	D	5:49	B	10 43	32	11 37	2 3/4	2 3/4	9:14	B	11:24	E	TAU	19
297	24	Th.	7:07	D	5:48	B	10 41	32	11 58	3 1/2	3 1/2	10:07	B	12:09	E	ORI	20
298	25	Fr.	7:09	D	5:46	B	10 37	32	12 19	4 1/4	4 1/4	11:01	B	12:49	E	GEM	21
299	26	Sa.	7:10	D	5:45	B	10 35	32	12 39	5	5 1/4	11:58	C	1:25	E	GEM	22
300	27	F	7:11	D	5:43	B	10 32	32	12 59	6	6 1/4	—	—	1:58	E	CAN	23
301	28	M.	7:12	D	5:42	B	10 30	32	13 19	6 3/4	7	12:56	C	2:28	D	CAN	24
302	29	Tu.	7:14	D	5:41	B	10 27	32	13 39	7 1/4	8	1:55	C	2:57	D	LEO	25
303	30	W.	7:15	D	5:39	B	10 24	32	13 59	8 1/2	8 3/4	2:56	D	3:27	D	LEO	26
304	31	Th.	7:16	D	5:38	B	10 22	32	14 s. 18	9 1/4	9 3/4	3:59	D	3:57	C	VIR	27

OCTOBER

OCTOBER HATH 31 DAYS • 2013



Now autumn's fire burns slowly along the woods,
And day by day the dead leaves fall and melt. —William Allingham

Day of Month	Day of Week	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather
1	Tu.	♁♂♄ • Sea Gull Monument unveiled, Salt Lake City, Utah, 1913 • { 9.0 9.6	Showers
2	W.	Good management is better than good income. • { 9.5 9.8	fade
3	Th.	♁ ON EQ. • ♂ AT ♁ • U.S. Thanksgiving set as last Thursday in November, 1863 • { 9.9 10.1	for
4	Fr.	St. Francis of Assisi • New • Writer Anne Rice born, 1941	autumn's
5	Sa.	Shawnee chief Tecumseh died, 1813 • Tides { 10.7	grand
6	F	20th S. af. ♀. • ♁ AT ♁ • ♂♂♄ • { 10.4 11.0	parade.
7	M.	♁♂♄ • First photos taken of dark side of Moon, by Luna 3, 1959 • Tides { 10.4 11.2	Leaf
8	Tu.	♁♂♄ • Statesman John Hay born, 1838 • Tides { 10.3 11.2	season
9	W.	♁ RUNS LOW • ♀ GR. ELONG. (25° EAST) • Collegiate School (later, Yale) founded, Conn., 1701	comes
10	Th.	♁ AT PERIG. • ♂♂♂ • Painter Benjamin West born, 1738	with
11	Fr.	♁♂♄ • 19-lb. 2-oz. weakfish caught, Jones Beach, Long Island, N.Y., 1984	lightning's
12	Sa.	You will never get ahead trying to get even. • { 9.5 10.4	bugles
13	F	21st S. af. ♀. • Several countries adopted Greenwich longitude as prime meridian, 1884	and
14	M.	Columbus Day • Thanksgiving Day • Tides { 9.8 10.3	thunder's
15	Tu.	♁♂♄ • "Hazel II" storm flooded Toronto, 1954 • Tides { 10.2 10.4	drums!
16	W.	♁ ON EQ. • Warm October, cold February. • Tides { 10.6 10.5	Sumac
17	Th.	St. Ignatius of Antioch • ♂♂♄ • Tides { 10.9 10.5	clothed
18	Fr.	St. Luke • Full Hunter's • Eclipse ♁ • St. Luke's little summer.	in
19	Sa.	♁ AT ♁ • Abe Lincoln wrote to 11-yr.-old girl who requested that he grow a beard, 1860	bright
20	F	22nd S. af. ♀. • Canadian newspaper La Presse debuted, 1884	vermilion,
21	M.	♀ STAT. • Trimline phone first placed in service, Mich., 1963 • Tides { 10.0 10.7	golden
22	Tu.	Timber rattlesnakes move to winter dens. • Tides { 9.7 10.4	maples
23	W.	St. James of Jerusalem • ♁ RIDES HIGH • Tides { 9.3 10.1	by
24	Th.	He who is afraid of the leaves must not go into the wood.	the
25	Fr.	♁ AT APO. • ♂♂♄ • Little brown bats hibernate now. • Tides { 8.7 9.3	million!
26	Sa.	Michael Jackson rec'd patent for shoes that allow wearer to lean far forward, 1993 • Tides { 8.5 9.1	We're
27	F	23rd S. af. ♀. • 16' Burmese python caught in Everglades, Fla., 2011 • { 8.5 8.9	not
28	M.	Sts. Simon & Jude • ♂♂♂ • Boston Red Sox won World Series, 2007	joking:
29	Tu.	♁♂♄ • Snow hurricane (Ginny) hit Maine, 1963	a
30	W.	♁ ON EQ. • Orson Welles' "War of the Worlds" broadcast panicked listeners, 1938	Halloween
31	Th.	All Hallows' Eve • Reformation Day • { 9.8 9.6	soaking!

Farmer's Calendar

■ Compost, often referred to as "black gold," is a safe, efficient fertilizer that contains all essential plant nutrients. In addition, it conditions the soil for maximum root growth and helps to retain soil moisture.

Creating compost is not a new idea. In fact, Nature has been doing it since long before dinosaurs roamed. When leaves and dead branches fall to the forest floor and decay, they are composting. This natural recycling, brought about through the activities of soil microbes, releases nutrients to feed plant roots, allowing future generations of leaves and shoots to flourish.

Gardeners have devised ways to speed up Nature's metabolic method. They mix lots of "brown" (carbon-rich) materials, such as straw and shredded dry leaves, with a smaller amount of "green" (nitrogen-rich) materials, such as grass clippings and garden waste. When combined properly, the materials heat up and decompose with no bad odor. Turning the pile often will hasten the process.

As landfill space becomes increasingly scarce and expensive, composting yard and kitchen waste is becoming a necessity. Some recycling centers compost and allow folks to take home the finished product for their gardens. Perhaps we are learning what Nature has known all along.

NOVEMBER





THE ELEVENTH MONTH • 2013

SKY WATCH ☆ The year's only total eclipse, of the Sun, occurs on the 3rd and is visible from the equatorial Atlantic Ocean and west central Africa. Saturn is gone, but Venus starts to show some elevation gain as it noticeably brightens to magnitude -4.8 . The Moon, dangling below invisible Pluto, stands above Venus on the 6th. The Moon hovers just above Uranus on the 13th, to the lower right of Jupiter on the 21st, and to the right of faint Mars on the 27th. The Orange World is now rising at 1:00 A.M. Mercury, at magnitude -0.7 , appears low in the east at about 40 minutes before sunrise, where it closely meets returning planet Saturn, which shines at a bright magnitude 0.6, on the 25th and 26th.

●	New Moon	3rd day	7th hour	50th minute
◐	First Quarter	10th day	0 hour	57th minute
○	Full Moon	17th day	10th hour	16th minute
◑	Last Quarter	25th day	14th hour	28th minute

After 2:00 A.M. on November 3, Eastern Standard Time is given.

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Day of Year	Day of Month	Day of Week	 Rises h. m.	Rise Key	 Sets h. m.	Set Key	Length of Day h. m.	Sun Fast m.	Declination of Sun ° ' s	High Tide Times Boston	 Rises h. m.	Rise Key	 Sets h. m.	Set Key	Place	Age
305	1	Fr.	7:17	D	5:37	B	10 20	32	14 s. 38	10 10 $\frac{1}{2}$	5:04	E	4:29	C	VIR	28
306	2	Sa.	7:18	D	5:35	B	10 17	32	14 56	10 $\frac{3}{4}$ 11 $\frac{1}{4}$	6:12	E	5:05	B	VIR	29
307	3	F	6:20	D	4:34	B	10 14	32	15 15	10 $\frac{1}{2}$ 11	6:21	E	4:46	B	VIR	0
308	4	M.	6:21	D	4:33	B	10 12	32	15 34	11 $\frac{1}{4}$ 11 $\frac{3}{4}$	7:30	E	5:34	B	LIB	1
309	5	Tu.	6:22	D	4:32	B	10 10	32	15 52	12 —	8:36	E	6:29	B	SCO	2
310	6	W.	6:23	E	4:31	B	10 08	32	16 10	12 $\frac{1}{2}$ 12 $\frac{3}{4}$	9:38	E	7:31	B	OPH	3
311	7	Th.	6:25	E	4:30	B	10 05	32	16 27	1 $\frac{1}{2}$ 1 $\frac{3}{4}$	10:32	E	8:37	B	SAG	4
312	8	Fr.	6:26	E	4:28	B	10 02	32	16 45	2 $\frac{1}{4}$ 2 $\frac{1}{2}$	11:20	E	9:46	C	SAG	5
313	9	Sa.	6:27	E	4:27	B	10 00	32	17 02	3 $\frac{1}{4}$ 3 $\frac{1}{2}$	12:01	E	10:56	C	CAP	6
314	10	F	6:29	E	4:26	B	9 57	32	17 19	4 $\frac{1}{4}$ 4 $\frac{3}{4}$	12:37	D	—	—	AQU	7
315	11	M.	6:30	E	4:25	B	9 55	32	17 35	5 $\frac{1}{4}$ 5 $\frac{3}{4}$	1:10	D	12:04	D	AQU	8
316	12	Tu.	6:31	E	4:24	B	9 53	32	17 51	6 $\frac{1}{2}$ 6 $\frac{3}{4}$	1:42	D	1:11	D	PSC	9
317	13	W.	6:32	E	4:23	B	9 51	31	18 07	7 $\frac{1}{2}$ 7 $\frac{3}{4}$	2:13	C	2:17	D	PSC	10
318	14	Th.	6:33	E	4:22	B	9 49	31	18 23	8 $\frac{1}{4}$ 8 $\frac{3}{4}$	2:44	C	3:22	E	PSC	11
319	15	Fr.	6:35	E	4:22	B	9 47	31	18 38	9 9 $\frac{3}{4}$	3:18	B	4:26	E	PSC	12
320	16	Sa.	6:36	E	4:21	B	9 45	31	18 53	10 10 $\frac{1}{2}$	3:54	B	5:28	E	ARI	13
321	17	F	6:37	E	4:20	B	9 43	31	19 08	10 $\frac{1}{2}$ 11 $\frac{1}{4}$	4:34	B	6:28	E	ARI	14
322	18	M.	6:38	E	4:19	B	9 41	31	19 22	11 $\frac{1}{4}$ 11 $\frac{3}{4}$	5:18	B	7:25	E	TAU	15
323	19	Tu.	6:40	E	4:18	B	9 38	30	19 36	12 —	6:06	B	8:17	E	TAU	16
324	20	W.	6:41	E	4:18	B	9 37	30	19 49	12 $\frac{1}{2}$ 12 $\frac{1}{2}$	6:58	B	9:04	E	TAU	17
325	21	Th.	6:42	E	4:17	B	9 35	30	20 03	1 $\frac{1}{4}$ 1 $\frac{1}{4}$	7:51	B	9:46	E	GEM	18
326	22	Fr.	6:43	E	4:16	B	9 33	30	20 15	2 2	8:47	C	10:24	E	GEM	19
327	23	Sa.	6:44	E	4:16	B	9 32	29	20 28	2 $\frac{3}{4}$ 2 $\frac{3}{4}$	9:44	C	10:57	E	CAN	20
328	24	F	6:46	E	4:15	B	9 29	29	20 40	3 $\frac{1}{2}$ 3 $\frac{1}{2}$	10:42	C	11:28	D	CAN	21
329	25	M.	6:47	E	4:14	A	9 27	29	20 52	4 $\frac{1}{4}$ 4 $\frac{1}{2}$	11:41	D	11:57	D	LEO	22
330	26	Tu.	6:48	E	4:14	A	9 26	28	21 03	5 5 $\frac{1}{4}$	—	—	12:26	D	SEX	23
331	27	W.	6:49	E	4:14	A	9 25	28	21 14	6 6 $\frac{1}{4}$	12:42	D	12:55	C	LEO	24
332	28	Th.	6:50	E	4:13	A	9 23	28	21 24	6 $\frac{3}{4}$ 7 $\frac{1}{4}$	1:44	D	1:25	C	VIR	25
333	29	Fr.	6:51	E	4:13	A	9 22	27	21 34	7 $\frac{1}{2}$ 8	2:49	E	1:58	C	VIR	26
334	30	Sa.	6:52	E	4:12	A	9 20	27	21 s. 44	8 $\frac{1}{4}$ 9	3:57	E	2:36	B	VIR	27

NOVEMBER

NOVEMBER HATH 30 DAYS • 2013



*The hoar-frost gathered, o'er each leaf and spray
Weaving its filmy network; thin and bright.* —Sarah Helen Whitman

Day of Month	Day of Week	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather
1	Fr.	All Saints' • ♀ IN INF. ♂ ♀ GR. ELONG. (47° EAST) • Tides {10.3 9.9	Falling
2	Sa.	All Souls' • Sadie Hawkins • Actor Burt Lancaster born, 1913 • Tides {10.8 10.1	drops
3	F	Daylight Saving Time ends, 2:00 A.M. • New • Eclipse ☉ • ☾ AT ☽	turn
4	M.	Islamic Earthquake shook N.Y., New England, and eastern Canada, 1877	to flying
5	Tu.	Election Day • He who is a slave of truth is a free man. • Tides {11.7	flakes,
6	W.	☾ RUNS LOW • ☾ AT PERIG. • ♂ ♀ ☾ • ♂ ♀ ☾ • Tides {10.4 11.7	burying
7	Th.	♂ ♀ ☾ • ♀ STAT. • Black bears head to winter dens now. • Tides {10.3 11.5	hillsides,
8	Fr.	Montana became 41st U.S. state, 1889 • Tides {10.1 11.2	fields,
9	Sa.	Canada's first domestic communications satellite, Anik A1, launched, 1972 • Tides {10.0 10.7	and
10	F	25th S. af. P. • ♀ STAT. • Lutheran church founder Martin Luther born, 1483	lakes.
11	M.	St. Martin of Tours • Veterans Day • ♂ ♀ ☾ • Tides {9.9 10.1	Gray
12	Tu.	Indian Summer • ☾ ON EQ. • Lobsters move to offshore waters. • Tides {10.1 9.9	skies
13	W.	♂ ♂ ☾ • ♀ STAT. • Bob Pettit first to reach 20,000 career points in NBA, 1964	surprise
14	Th.	Lightning struck Apollo 12, 1969 • Crab apples are ripe now.	us
15	Fr.	♂ ♀ ☾ • Astronomer Sir William Herschel born, 1738 • Tides {10.7 9.8	with
16	Sa.	☾ AT ☽ • Racehorse Northern Dancer died, 1990 • Tides {10.8 9.8	temperatures
17	F	26th S. af. P. • Full Beaver • ♀ GR. ELONG. (19° WEST)	icy—
18	M.	72°F, Youngstown, Ohio, 1958 • Tides {10.7 9.5	driving's
19	Tu.	☾ RIDES HIGH • Skunks hibernate now. • Talk show host Larry King born, 1933	dicey.
20	W.	Tucson Municipal Flying Field became first municipal airport in nation, Ariz., 1919	This
21	Th.	As November 21st, so is the winter. • Tides {9.2 10.0	Thanksgiving,
22	Fr.	☾ AT APO. • ♂ ♀ ☾ • U.S. president JFK assassinated, 1963 • Tides {9.0 9.7	even
23	Sa.	St. Clement • 14" snow, Yarmouth, Mass., 1989 • Tides {8.8 9.4	the
24	F	27th S. af. P. • "Battle Above the Clouds," Lookout Mtn., Chattanooga, Tenn., 1863	turkey
25	M.	♂ ♀ ☾ • Last log entry for Mary Celeste before crew disappeared, 1872 • Tides {8.7 8.9	is
26	Tu.	Thelma Chalifoux first Métis woman to become Canadian senator (Alta.), 1997 • Tides {8.8 8.8	shivering!
27	W.	☾ ON EQ. • ♂ ♂ ☾ • Shakespeare got license to marry Anne Hathaway, 1582	Mild
28	Th.	First day of Chanukah • Thanksgiving Day • Tides {9.5 9.0	reprieve,
29	Fr.	Warm food, warm friendships. • English first used during U.S. Catholic mass, 1964	we
30	Sa.	St. Andrew • ☾ AT ☽ • Mason jar (by John Mason) patented, 1858 • Tides {10.5 9.6	believe.

Humor is mankind's greatest blessing. —Mark Twain

Farmer's Calendar

■ After a treacherous voyage and brutal first winter spent along the shore of Cape Cod Bay, the Pilgrims of Plymouth Colony had a stroke of good fortune. Members of the Wampanoag Nation offered to teach them how to gather food from the wild and cultivate native crops such as corn. The first harvest, in 1621, proved so successful that Governor William Bradford ordered a feast to celebrate. We now call this the Pilgrims' first Thanksgiving, although they considered it simply a harvest festival. The event, however, was a far cry from today's observance.

The thankful colonists, soon joined by their generous Native American friends, took part in a 3-day party that included singing, dancing, musket and bow-and-arrow competitions, and footraces.

Historians can document with certainty only two items on the menu for that day: fowl provided by the Pilgrims and venison brought by the Wampanoag. Seafood such as bass, cod, eels, clams, and mussels may have been on the table, possibly along with game such as harbor seal, waterfowl, rabbit, and gray squirrel. Roots, fruit, and nuts were also common fare of the day. We don't know for sure whether turkey was served, but it has somehow become a tradition—and that's another reason to celebrate.

D E C E M B E R

THE TWELFTH MONTH • 2013

SKY WATCH ☆ *Venus continues to climb higher in the west after sunset as it brightens to magnitude -4.9, its most dazzling display of the year. An easy 25 degrees high, it dangles beneath the crescent Moon on the 5th. The Moon floats above green Uranus on the 10th and is to the left of Taurus's orange star Aldebaran on the 15th. In its fat gibbous phase, the Moon diminishes the normally reliable Geminid meteors on the 13th and stands to the right of Jupiter on the 18th. Jupiter, in Gemini, conveniently rises by 7:00 P.M. and shines at a brilliant magnitude -2.7. The Giant Planet is now a telescopic showpiece in advance of its imminent opposition on January 5. Winter begins with the solstice at 12:11 P.M. on the 21st.*

●	New Moon	2nd day	19th hour	22nd minute
◐	First Quarter	9th day	10th hour	12th minute
○	Full Moon	17th day	4th hour	28th minute
◑	Last Quarter	25th day	8th hour	48th minute

All times are given in Eastern Standard Time.

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Day of Year	Day of Month	Day of Week	☀		☀		Length of Day	Sun Fast	Declination of Sun	High Tide Times Boston		☾		Place	Age		
			Rises h. m.	Rise Key	Sets h. m.	Set Key				Rises h. m.	Rise Key	Sets h. m.	Set Key				
335	1	F	6:53	E	4:12	A	9 19	27	21 s. 53	9 $\frac{1}{4}$	9 $\frac{3}{4}$	5:06	E	3:21	B	LIB	28
336	2	M.	6:54	E	4:12	A	9 18	26	22 02	10	10 $\frac{1}{2}$	6:15	E	4:13	B	LIB	0
337	3	Tu.	6:55	E	4:12	A	9 17	26	22 11	10 $\frac{3}{4}$	11 $\frac{1}{2}$	7:21	E	5:13	B	OPH	1
338	4	W.	6:56	E	4:11	A	9 15	25	22 19	11 $\frac{1}{2}$	—	8:21	E	6:20	B	SAG	2
339	5	Th.	6:57	E	4:11	A	9 14	25	22 26	12 $\frac{1}{4}$	12 $\frac{1}{2}$	9:14	E	7:31	C	SAG	3
340	6	Fr.	6:58	E	4:11	A	9 13	25	22 33	1 $\frac{1}{4}$	1 $\frac{1}{2}$	9:59	E	8:43	C	SAG	4
341	7	Sa.	6:59	E	4:11	A	9 12	24	22 40	2	2 $\frac{1}{4}$	10:38	E	9:54	D	AQU	5
342	8	F	7:00	E	4:11	A	9 11	24	22 46	3	3 $\frac{1}{4}$	11:13	D	11:03	D	AQU	6
343	9	M.	7:01	E	4:11	A	9 10	23	22 52	4	4 $\frac{1}{4}$	11:45	D	—	—	AQU	7
344	10	Tu.	7:02	E	4:11	A	9 09	23	22 57	5	5 $\frac{1}{2}$	12:16	C	12:10	D	PSC	8
345	11	W.	7:03	E	4:11	A	9 08	22	23 02	6	6 $\frac{1}{2}$	12:48	C	1:15	E	PSC	9
346	12	Th.	7:04	E	4:11	A	9 07	22	23 07	7	7 $\frac{1}{2}$	1:20	C	2:19	E	PSC	10
347	13	Fr.	7:05	E	4:12	A	9 07	21	23 11	8	8 $\frac{1}{2}$	1:55	B	3:21	E	ARI	11
348	14	Sa.	7:05	E	4:12	A	9 07	21	23 14	8 $\frac{3}{4}$	9 $\frac{1}{4}$	2:33	B	4:21	E	ARI	12
349	15	F	7:06	E	4:12	A	9 06	20	23 17	9 $\frac{1}{2}$	10 $\frac{1}{4}$	3:15	B	5:18	E	TAU	13
350	16	M.	7:07	E	4:12	A	9 05	20	23 20	10 $\frac{1}{4}$	10 $\frac{3}{4}$	4:01	B	6:11	E	TAU	14
351	17	Tu.	7:08	E	4:13	A	9 05	19	23 22	11	11 $\frac{1}{2}$	4:51	B	7:00	E	TAU	15
352	18	W.	7:08	E	4:13	A	9 05	19	23 23	11 $\frac{1}{2}$	—	5:44	B	7:44	E	GEM	16
353	19	Th.	7:09	E	4:13	A	9 04	19	23 25	12 $\frac{1}{4}$	12 $\frac{3}{4}$	6:39	C	8:24	E	GEM	17
354	20	Fr.	7:09	E	4:13	A	9 04	18	23 25	12 $\frac{3}{4}$	12 $\frac{3}{4}$	7:35	C	8:59	E	CAN	18
355	21	Sa.	7:10	E	4:14	A	9 04	18	23 26	1 $\frac{1}{2}$	1 $\frac{1}{2}$	8:33	C	9:31	E	CAN	19
356	22	F	7:10	E	4:15	A	9 05	17	23 25	2	2 $\frac{1}{4}$	9:31	D	10:00	D	LEO	20
357	23	M.	7:11	E	4:16	A	9 05	17	23 25	2 $\frac{3}{4}$	3	10:29	D	10:28	D	SEX	21
358	24	Tu.	7:11	E	4:16	A	9 05	16	23 24	3 $\frac{1}{2}$	3 $\frac{3}{4}$	11:29	D	10:56	C	LEO	22
359	25	W.	7:11	E	4:17	A	9 06	16	23 22	4 $\frac{1}{4}$	4 $\frac{1}{2}$	—	—	11:25	C	VIR	23
360	26	Th.	7:12	E	4:18	A	9 06	15	23 20	5	5 $\frac{1}{2}$	12:31	E	11:55	C	VIR	24
361	27	Fr.	7:12	E	4:18	A	9 06	15	23 17	6	6 $\frac{1}{2}$	1:36	E	12:30	C	VIR	25
362	28	Sa.	7:12	E	4:19	A	9 07	14	23 14	6 $\frac{3}{4}$	7 $\frac{1}{2}$	2:42	E	1:09	B	LIB	26
363	29	F	7:12	E	4:19	A	9 07	14	23 11	7 $\frac{3}{4}$	8 $\frac{1}{2}$	3:50	E	1:56	B	LIB	27
364	30	M.	7:13	E	4:20	A	9 07	13	23 07	8 $\frac{3}{4}$	9 $\frac{1}{4}$	4:57	E	2:51	B	SCO	28
365	31	Tu.	7:13	E	4:21	A	9 08	13	23 s. 02	9 $\frac{1}{2}$	10 $\frac{1}{4}$	6:01	E	3:55	B	OPH	29

DECEMBER

DECEMBER HATH 31 DAYS • 2013



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Then came the merry maskers in,
And carols roar'd with blithesome din. —Sir Walter Scott

Farmer's Calendar

■ If you are like most gardeners, you probably put your tools away at the end of the growing season and don't think very much about them until they are needed in the spring. But if you take a bit of time during the off-season to maintain and repair your tools, they will be safer and easier to use.

Wooden handles on tools such as shovels and iron rakes may become rough and splintery with weather, use, and age. Often, you can restore them by sanding the surface until it becomes smooth again and then applying linseed oil to protect the wood. Handles with deep cracks are a hazard and should be replaced.

Repair rusted metal tools by cleaning them with steel wool or a wire brush and then wiping on 30-weight motor oil to prevent further rusting.

Chances are, the blades on your pruners, loppers, and hedge shears could use sharpening. Use a fine flat file to touch them up. Be careful to keep the original angle of the blade's cutting edge. While you're at it, sharpen the metal edges of shovels and hoes to make digging easier.

Well-maintained, quality garden tools will last for years and can even be passed down from one generation to the next. Perhaps you can pass down the wisdom of how to take care of them, too.

Day of Month	Day of Week	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather
1	F	1st S. of Advent • ♂♂♂ • ♂♂♂ • Tides {11.1 9.9	Spell
2	M.	St. Viviana • New ● • Major League Baseball began accepting cowhide baseballs, 1974	it
3	Tu.	☾ RUNS LOW • Meteorologist Cleveland Abbe born, 1838 • {11.9 10.5	Decembrrrr!
4	W.	☾ AT PERIG. • ♂♂♂ • G. Washington bade farewell to officers, Fraunces Tavern, N.Y.C., 1783	Mild
5	Th.	♂♀♂ • First six astronauts chosen for Canadian Space Program, 1983 • {10.6 12.0	plus a
6	Fr.	St. Nicholas • A fire hard to kindle indicates bad weather. • Tides {10.6 11.8	shower,
7	Sa.	St. Ambrose • National Pearl Harbor Remembrance Day	then a
8	F	2nd S. of Advent • ♂♂♂ • Tides {10.4 10.8	power
9	M.	☾ ON EQ. • Public debut of computer mouse, San Francisco, 1968 • Tides {10.2 10.2	of
10	Tu.	St. Eulalia • Winterberry fruit especially showy now. • Tides {10.1 9.7	powder!
11	W.	♂♂♂ • Astronomer Annie Jump Cannon born, 1863 • Tides {10.1 9.4	Mercury
12	Th.	Our Lady of Guadalupe • Before honor is humility. • Tides {10.1 9.2	and
13	Fr.	St. Lucia • ☾ AT ♀ • First strike of Susan B. Anthony dollar, Philadelphia Mint, 1978	snow
14	Sa.	Halcyon Days begin. • Alabama became 22nd U.S. state, 1819	both
15	F	3rd S. of Advent • Beware the Pogonip. • Tides {10.3 9.1	falling;
16	M.	☾ RIDES HIGH • Lillian Disney, who named Mickey Mouse, died, 1997 • {10.4 9.1	malls
17	Tu.	Full Cold ○ • ♂ STAT. • Canadian "Maple leaf flag" approved by Senate, 1964	a-calling!
18	W.	Ember Day • Civil rights activist Rosa McCauley married Raymond Parks, 1932 • {10.3 —	Frozen
19	Th.	☾ AT APO. • ♂♂♂ • -59°F, Yellowstone National Park, Wyo., 1924	tundra—
20	Fr.	Ember Day • ♀ STAT. • France transferred Louisiana territory to U.S., 1803	no
21	Sa.	St. Thomas • Ember Day • Winter Solstice • Tides {9.1 9.8	wonder
22	F	4th S. of Advent • Geologist Ferdinand V. Hayden died, 1887 • {9.0 9.6	we're
23	M.	Part of Van Gogh's left ear cut off, 1888 • Tides {9.0 9.3	snowed
24	Tu.	☾ ON EQ. • "O Holy Night" part of first radio program broadcast, Brant Rock, Mass., 1906	under!
25	W.	Christmas • ♂♂♂ • One kind word can warm three winter months.	Will
26	Th.	St. Stephen • Boxing Day (Canada) • First day of Kwanzaa • Tides {9.3 8.7	winds
27	Fr.	St. John • ☾ AT ♀ • 12.5" snow, Dumas, Tex., 2000 • {9.6 8.8	be
28	Sa.	Holy Innocents • ♂♂♂ • Endangered Species Act signed into U.S. law, 1973	this
29	F	1st S. af. Ch. • ♀ IN SUP. ♂ • Deuterium discovery made public, 1931	keen
30	M.	☾ RUNS LOW • Everything has an end—except a sausage, which has two. • Tides {11.1 9.7	in
31	Tu.	St. Sylvester • ♂♂♂ • Iolani Palace cornerstone laid, Honolulu, 1879 • {11.6 10.2	2014?

Highlights from the Rapid Blight Studies ~ Dr. David Kopec, University of Arizona

On January 24th, the Cactus and Pine GCSA along with the University of Arizona (Kai Umeda), held the First Rapid Blight Summit at Superstition Springs Golf Course, outside of Phoenix. About 200 people attended the event. Michael Gorbachev did not make it. The conference addressed the history of the disease (only 12 years old now), what are some of the possible environmental stresses that trigger the disease, what grasses are susceptible and what grasses are resistant, and what pesticides keep it in check.

Rapid Blight affects young seedlings cool season grasses when used for winter overseeding more so than at any other time. The disease causes a stunting and twisting of the leaves, and at first, looks like a hot iron was placed on the turf for one second and then lifted up. The blotchy sunken turf turns off color quickly, then browns up and dies. It's worse on the young plants of overseeded grasses and is associated with salty water/soils.

Rapid Blight symptoms occur rapidly, and are most likely to show up right after the first mowings. It develops quickly in cart, equipment and traffic paths. It also been identified in the late spring on mature stands of the overseed where irrigation spots are less than average. In these "spots" salt builds up from less than average irrigation coverage.

The cause of Rapid Blight is caused by a unique organism. It's not a fungus, a bacteria, or a virus. It's caused by an ocean related disease organism that affects ocean plants. In fact, Rapid Blight is the first land form of this organism on the whole plant. So its name is *Labyrinthula terrestris*. Aren't we lucky!

Chemical controls are extremely limited, and the success of curative treatments depend only on how advanced the disease has progressed before you spray. Many fungicides have no affect, but tank mixes or a rotation of Fore and Insignia have produced fairly good results so far. Other related fungicides similar to Insignia have little or no control. If this disease gets resistant to the few fungicides used to control/suppress it, then we'll all be in super big trouble.

The disease is associated with saline soil conditions. Granted "salty" water makes for salty soil, but even moderately saline water produces salty soils in areas which get less applied water when irrigation uniformity becomes part of the equation.

Survey and research work by PACE Institute, the University of California, Clemson University and the University of Arizona have some common findings. They are (1) Rapid Blight is usually most often on soils with EC levels of 1.5 to 3.6 (same as 960 to about 2400 ppm or mg/L). The organism is not found as often at salinity levels higher than 3500 ppm.

Background surveys and sample analysis from PACE show that by observation, that a soil threshold of anything over 110 ppm extractable sodium makes Rapid Blight worse. Sodium may be just as much a culprit is in inciting Rapid Blight, as is total salts that the young plants experience. Mary Olsen did experiments were results s showed that high salinity water that had a large quantity of potassium salts were not as proficient in developing symptoms versus the case when sodium salts were used to achieve the same salinity level. Field observations in California have shown in extreme cases that even golf courses with low salinity (but high sodium) have developed Rapid Blight more severely than another course which had nearly the same low salt levels, but with less sodium. It is unknown what the potential effect of sodium itself has on the infectious nature of Rapid Blight. Does sodium affect the plant (even if it's salt tolerant), or is it a requirement for the organism? No one knows for sure. One thing currently is for sure, "salty soil conditions" out west are almost always associated with high sodium levels in our irrigation water and subsequently in the soil. As usual, the only way to keep salt levels down is to add greater amounts of the same irrigation water so salts won't get too high in the soil (leaching). Gypsum does not decrease the salt load. Gypsum is the most effective and cheapest way to keep soil sodium levels low. So keeping gyp'in', and flippin' the water on, above and beyond normal irrigation turf water replacement values.

Rapid Blight can be disastrous to *Poa trivialis* and perennial ryegrass, and colonial bentgrass. Certain varieties of fine fescues do not show symptoms compared to others. Dawson slender creeping red fescue, SR5210 slender creeping red fescue, show a near absence of the disease symptoms in closely mowed turf plots, as does SR5100 creeping red fescue. Providence creeping bentgrass also has showed very little disease in three years of field testing The same was true for Fufts alkaligrass. These grasses may carry the disease on the tissue, but there are no visible symptoms. There is much to find out why this is the case.

For overseeding, the above "tolerant" grasses are slower to germinate and establish compared to perennial ryegrass. That's a problem. Seed mixtures should be developed which have components of grasses which strike a balance in germination, establishment, and tolerance to rapid Blight. Most courses with a history of rapid Blight still rely on Fore and Insignia for the first two months after actual overseeding, especially on greens and tees.

Research by Mary Olsen at the University of Arizona showed that *Labyrinthula* can be found on bermudagrass in the summer, even on turfs which do not show the disease on *Poa trivialis* on ryegrass when overseeded on the same golf course! There is a lot to learn about cracking the case for this "baby new" disease. We have learned a lot about this disease in just the last four years, but only through further research will we be able to develop better management strategies since we need to know more about the exact nature of salinity and sodium, what the infection process is, why some grasses are susceptible and others not. We are lucky that there are two fungicides that keep this organism in check. Remember that it is not a fungus.

Until then, keep flushing salts through leaching, keep sodium levels from soil tests as low as possible with gypsum, and if disease threat is high, use Fore and Insignia.

A special thanks was noted to Mick Twito CGCS, who was a pioneer in dealing with Rapid Blight from 2000 to 2006 when he was at Estrella Mountain Ranch. He conducted many practical trials and made good progress while keeping the golf course open and in good shape. He earned the name "Sir mix -a- lot" since he made most of the fungicide applications himself. Mick was an excellent cooperater and kept all of the numerous test plots in top shape year after year.

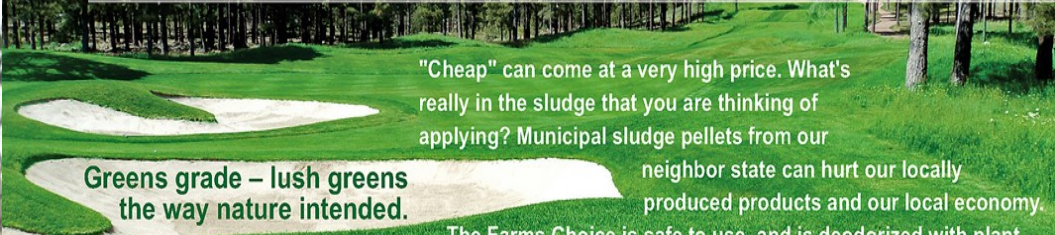
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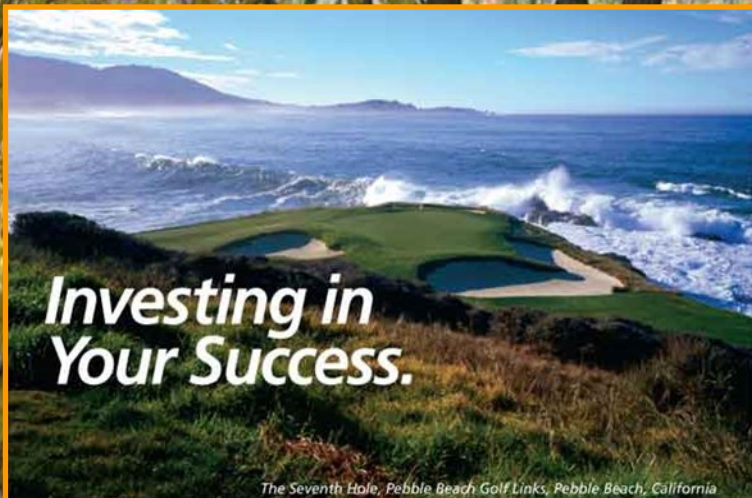
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A sliced Carrot looks like the human eye. The pupil, iris and radiating lines look just like the human eye.. And YES, science now shows carrots greatly enhance blood flow to and function of the eyes.

A Tomato has four chambers and is red. The heart has four chambers and is red. All of the research shows tomatoes are loaded with lycopine and are indeed pure heart and blood food.

Grapes hang in a cluster that has the shape of the heart. Each grape looks like a blood cell and all of the research today shows grapes are also profound heart and blood vitalizing food.

A Walnut looks like a little brain, a left and right hemisphere, upper cerebrums and lower cerebellums. Even the wrinkles or folds on the nut are just like the neo-cortex. We now know walnuts help develop more than three (3) dozen neuron-transmitters for brain function.

Kidney Beans actually heal and help maintain kidney function and yes, they look exactly like the human kidneys.

Celery, Bok Choy, Rhubarb and many more look just like bones. These foods specifically target bone strength. Bones are 23% sodium and these foods are 23% sodium. If you don't have enough sodium in your diet, the body pulls it from the bones, thus making them weak. These foods replenish the skeletal needs of the body.

Avocadoes, Eggplant and Pears target the health and function of the womb and cervix of the female - they look just like these organs. Today's research shows that when a woman eats one avocado a week, it balances hormones, sheds unwanted birth weight, and prevents cervical cancers. And how profound is this? It takes exactly nine (9) months to grow an avocado from blossom to ripened fruit. There are over 14,000 photolytic chemical constituents of nutrition in each one of these foods (modern science has only studied and named about 141 of them).

Figs are full of seeds and hang in twos when they grow. Figs increase the mobility of male sperm and increase the numbers of Sperm as well to overcome male sterility.

Sweet Potatoes look like the pancreas and actually balance the glycemic index of diabetics.
Olives assist the health and function of the ovaries

Oranges, Grapefruits, and other Citrus fruits look just like the mammary glands of the female and actually assist the health of the breasts and the movement of lymph in and out of the breasts.

Onions look like the body's cells. Today's research shows onions help clear waste materials from all of the body cells. They even produce tears which wash the epithelial layers of the eyes. A working companion, Garlic, also helps eliminate waste materials and dangerous free radicals from the body.

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Barry	MacBan	Simplot Partners	Turf Care Products ~ Distributor
Tom	Knecht	Simpson Norton Corporation	Golf Course Equipment
Kimberly	Gard	Syngenta	Turf Care Products ~ Manufacturer
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Smell of fresh grass can relieve stress

Mowing the lawn can help you beat stress, a new study has suggested.

Researchers have found that a chemical released by freshly mowed grass can help people relax and make them cheerful, thus slowing down the decline in mental ability with age.

Scientists claim the scent released from the grass works directly on the brain, specially affecting the emotional and memory parts called the amygdala and the hippocampus. After seven years of rigorous research, scientists now claim to have made a perfume, the "eau de mow" which "smells like a freshly-cut lawn", and helps relieve stress and enhance memory.

Dr Nick Lavidis, a neuroscientist at the University of Queensland, Brisbane, developed the idea of the perfume, named Serenascent, after he trekked a US forest twenty years ago. The Telegraph quoted him as saying: "Three days in Yosemite National Park felt like a three-month holiday.

"I didn't realize at the time that it was the actual combination of feel-good chemicals released by the pine trees, the lush vegetation and the cut grass that made me feel so relaxed.

"Years later my neighbor commented on the wonderful smell of cut grass after I had mowed the lawn and it all started to click into place."

Dr Lavidis said the grass" smell directly affected the brain's emotional and memory parts.

He said: "These two areas are responsible for the flight or fight response and the endocrine system, which controls the releasing of stress hormones like corticosteroids.

"The new spray appears to regulate these areas.

"There are two types of stress. The first is when you are about to perform something or you know you are going to have to do something well. That's acute stress and can be a good form of stress.

"Bad stress is chronic stress and is associated with an increase in blood pressure, forgetfulness and a weakening of the immune system."

Chronic stress can actually damage the hippocampus in the brain, which can lead to memory loss.

Students of the Australian project found animals exposed to Serenascent had little or no damage to the hippocampus.

The scent is believed to have the "pleasant aroma of a freshly-cut lawn or a walk through a lush forest".

Dr Lavidis, who worked with pharmacologist Professor Rosemary Einstein, said: "It can be used as a room spray or a personal spray on bed linen, a handkerchief or clothing. Down the track we will look at incorporating the feel good chemicals into other products."

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Why Herbicides Control Weeds Or Why They Sometimes Do Not Perform As Expected

Kai Umeda – Area Extension Agent

Herbicide labels usually suggest or recommend the addition of an adjuvant to the spray mixture. Adjuvants are generally surfactants, crop oils, methylated seed oils (MSO), fertilizers, anti-foamers, defoamers, drift retardants, or other material that can be added to a tank-mix to aid or modify the action of herbicides, insecticides, fungicides, other spray products. An adjuvant interacts with the pesticide or plant-applied product in water when it is sprayed on the target under various environmental conditions. The pesticide rate and timing of application on various sized weeds, insects, or disease infection under hot or cold and wet or dry conditions frequently affect the optimal performance of a spray treatment.

Deposition and retention is affected by characteristics of the foliage on a plant. The leaf angle is important for intercepting sprays. A horizontal leaf surface can be covered more effectively than a vertical or upright leaf that would be prone to run-off of sprays. The leaf surface could be hairy or pubescent to retain sprays or prevent adequate leaf wetting. Sparse pubescence may allow spray droplets to be retained on the leaf surface and enhance wetting to allow absorption into the leaf. Very dense hairs may prevent the spray droplets from contacting and penetrating the leaf surface. Leaf surfaces with a waxy cuticle may prevent adequate deposition and retention as spray droplets roll off the leaf.

An adjuvant can enhance the deposition of a sprayed material on the plants' surfaces – leaves and stems. After the spray is placed on the leaves, the adjuvant can assist with the retention on the leaf surface. The active ingredient of the sprayed product can then be absorbed into the plant and then translocated to the site of action.

Adjuvants can “activate” pesticides by helping to overcome physical barriers or characteristics of the plants' leaf surfaces. Non-ionic surfactants (NIS), crop oil concentrates (COC), methylated seed oils, and nitrogen fertilizers typically are added to pesticides. There are several combinations of these basic adjuvants such as surfactants plus silicone, surfactants plus fertilizer, surfactants plus water conditioning agents, MSO plus water conditioning agents, MSO plus organosilicone surfactants, surfactants plus drift retardant, surfactant plus defoamer, ammonium sulfate (AMS), AMS plus surfactant plus defoamer, urea ammonium nitrate (28% UAN), etc.

Non-ionic surfactants facilitate wetting and more uniform spreading of the spray onto the leaf surface. The spray droplet surface tension is reduced as the water-loving (hydrophilic) and oil-loving (lipophilic) characteristics of the surfactant interact with the pesticide in the spray water. Petroleum-based COC's facilitate the penetration of the pesticide active ingredient through the leaf cuticle. MSO's are derived from soybean, corn, sunflower, or other crop seed oils that are reacted with methanol. MSO's are improved spreaders than COC's and have high boiling points that reduce evaporation from the leaf surface to increase penetration of especially waxy cuticles. The fertilizers, AMS and UAN optimize performance of herbicides by offsetting effects of salts in spray water.

There are several adjuvants that have a broad range of materials in their containers with claims of improving the efficacy of pesticides. The costs are varied from inexpensive to very expensive as well. Adjuvants are not stringently regulated like pesticides and the active components and quality may change depending on manufacturing processes to adjust oil type or percent surfactant. The Chemical Producers and Distributors Association have a voluntary labeling and performance standard for adjuvants.



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Comparing Budgets

By Brian Whitlark ~Agronomist with the Southwest Region of the USGA Green Section

In travels throughout the Southwest Region, from time to time the question is raised with regards to what the course down the street is spending with hopes of making an argument for more money or labor for their own course. While this update will provide a few methods used to compare golf course operations, it is important to point out that the validity of such comparisons is questionable. The difficulty associated with comparing course operations can be attributed to such items as:

Greens size, method of construction and turfgrass variety varies from course to course.

Public, private and semi-private courses vary significantly with regards to golfer expectations.

The number of bunkers and bunker design on the golf course play a significant role in the budget and labor hours spent in maintenance.

Water and soil quality can have a big impact on the products and labor hours dedicated to grow turf in challenging conditions.

Clearly, this list is not comprehensive, but it gives a few examples of why comparisons from course to course are difficult at best.

Comparisons may be useful in certain circumstances. The list below provides a few indicators that can potentially be used to compare and contrast courses:

Maintenance cost per acre. As an example, figures from the Florida GCSA report high values of \$56,000, \$75,000 and \$125,000 maintenance cost per acre, with median values of \$15,000, \$13,000 and \$10,000/acre from three different regional areas, respectively.

Labor hours per week. Based on recent visits in New England, high end clubs in the region typically use approximately 1,000 man hours per week (excluding the superintendent and mechanic), with an average closer to 600-700 man hours per week.

Labor hours per hole. At one time, the rule-of-thumb as reported by the GCSAA was to use one laborer per hole (excluding the superintendent, assistant superintendent and mechanic) for higher tier courses.

Maintenance budget dollars per golf round. For example, if the maintenance budget is 1 million dollars and the total number of rounds for the year is 15,000, then the maintenance budget dollars per round would be \$66 ($\$1,000,000/15,000$ rounds).

Across the board, most superintendents in the Southwest Region have had their budgets frozen or reduced in recent years, which is likely why some look to compare course operations with hopes of increasing resources.

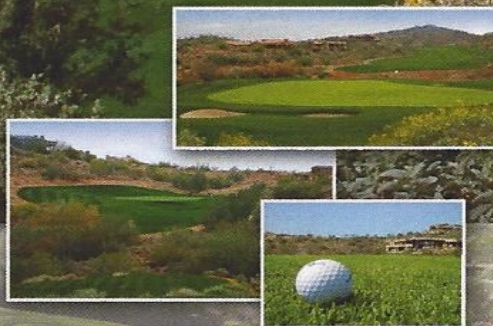
Rather than focusing on resources you don't have, use this opportunity to educate golfers and course officials that in some cases golfer expectations and the related course maintenance to satisfy those expectations have gotten out of hand, and it is time to scale back on such items as bunker maintenance and out of play areas. The key is to document and communicate changes needed to sustain a healthy bottom line during difficult economic times.

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Hope: To want something to happen or be true and think that it could happen or be true

-Derek Wilkerson, CGCS

In July of this year I was blessed with the opportunity to bring hope to the residents of the Mathare Valley slums in Nairobi, Kenya, Africa. I embarked on a journey that not only changed their lives, but mine as well. Approximately 1 million residents live in 2 square miles in the Mathare Valley and it is the second largest slum in the world. Many of the residents are second and third generation families with a scattering of the original settlers that moved to Nairobi in hope of changing their lives for the better. Poverty, by our western definition is widespread but they are content with the conditions in which they live.

We embarked on a mission trip titled "Bring the Light". We took 29 members to help improve the quality of life, provide education programs, promote economic development projects and personal evangelism initiatives. Each day we spent time in the local schools teaching vacation bible school topics while spending our afternoons in the community installing skylights in the homes of the residents. The majority of the homes were without electricity, so the skylights provided much needed light to the homes. We worked along side CHE, Community Health Evangelism/ Education and MOHI, Missions of Hope International workers everyday. While the skylights were being installed we educated the residents about malaria and AIDS. Many of them believed the medical conditions to be a curse from a witch doctor. It was amazing to witness the transformation and see the glimmer of hope we instilled in each of them.

For the people who live in the slums of Nairobi daily life is full of dangers: lack of food, disease, thieves, gangs and more. Despite this some of the most powerful dangers are intangible ones: depression, uncertainty, fear, and despair. For individuals and families trapped by these forces, there appears to be no way out and no chance of a better future.

Missions of Hope International(MOHI) is working in the Mathare slums of Nairobi, Kenya. Their focus is to share the love of Jesus Christ by bringing holistic, sustainable, and long term solutions to the residents of Mathare. Through their work, Missions of Hope International is seeing a transformation among the Mathare communities. One by one, individuals are seeing ways out of the trap of poverty. Family by family, community by community lives are being improved and people are able to look into the future with something new - **hope**.





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