

ing that gene might be the culprit, the researchers took a functional version of the gene from normal plants and put it into the mutants. The mutant legumes then began fixing nitrogen the same as normal ones, “proving that we found the right gene,” said Wang.

How less is more

Since 1960, the use of nitrogen fertilizer in the United States has roughly quadrupled, as has the price per ton, according to the U.S. Department of Agriculture. Prices have been driven up by the rising cost of natural gas used to manufacture the fertilizer.

“Everything we learn about what makes symbiosis work gives us a tool to understand why, sometimes, symbiosis fails.”

—SHARON LONG

“That might make things more expensive for American farmers and increase food prices for consumers, but this is going to wipe out people in developing countries, whose soils are perhaps most in need of fertilizers,” Long said. “This is a crucial issue. And nitrogen fixation is a key to sustainability.”

Costs aside, the production of chemical fertilizer also adds to the problem of global warming, both by way of the fossil fuels used in production of chemical fertilizer and through the impact of leftover fertilizer that degrades into nitrous oxide, a highly potent greenhouse gas.

With the planet’s ever-growing population, Long said there is going to be increased need to keep productivity going on lands that are starting to become marginal because of drought, temperature or salinity problems, among others.

“The rhizobium bacteria are a critical partner in whether that kind of extension of serviceable land can occur,” she said. “In order for us to take existing symbioses and help make them better, optimize them for being productive even when conditions start to deteriorate, tools such as understanding how to improve nitrogen fixing in legumes are crucial.”

Joel Griffiths and Colby Starker, also authors on the paper, contributed to the research when they were graduate students or postdoctoral scholars in Long’s lab. Griffiths is now an assistant professor at Brigham Young University. Starker is a research associate at the University of Minnesota. The research was supported by the Howard Hughes Medical Institute, the Helen Hay Whitney Foundation and the National Science Foundation.

Bergeron, Louis. “Discovery in legumes could reduce fertilizer use, aid environment, say Stanford researchers,” Stanford Report, February 26, 2010.

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GCSANC Members Have Presence at California Alliance for Golf Meeting at Sequoyah County Club

The GCSANC had a strong presence at the recent California Alliance for Golf (CAG) meeting held at Sequoyah Country Club (Oakland, CA) where golf industry leaders gathered to reaffirm the *purpose* and *vision* of CAG, an organization that educates and advocates on behalf of the California golf industry. The alliance is also committed to helping protect water resources for the golf industry.

The meeting (which attracted participants from throughout the state) was hosted by GCSANC member **Tom Schunn** and GCSANC member **Terry Grasso, CGCS**. The meeting kicked off with GCSANC member/CAG president **Ted Horton, CGCS**, introducing Henry DeLozier, principal with Global Golf Advisors, who did a stellar job as meeting facilitator.

Other chapter members in attendance included: Vice President **Glen Matthews**, Past President **Gary Carls, CGCS**, **Gary Ingram, CGCS** (Superintendent of the Year), Affiliate members **Chuck Talley** of Turf Star and **Greg Fernald** of Target Specialty Products. CGCSA past president **Bruce Williams, CGCS**, was also in attendance.

It was apparent the gathering served as a timely checkpoint for CAG supporters. Throughout the session DeLozier proposed a series of thought-provoking questions in reference to the alliance: *Where do you feel CAG is currently? Do you feel CAG is relevant to the success you had on the tax issue? Do you believe CAG has demonstrated its relevance specifically to the people who do their work in Sacramento? Has CAG made a difference?* Much discussion prevailed and participants shared the alliances accomplishments: creating a “united” voice in golf, the completion of a second *California economic golf study*, and *battling golf-related tax issues*. Even with the accomplishments, it was well-noted that there was still plenty of work ahead for the alliance.

Through DeLozier’s savvy assistance, the discussion transformed into a mini SWOT analysis identifying CAG’s *strengths, weaknesses, opportunities & threats*. DeLozier posed other poignant questions to the group: *As you think about what CAG should be doing as it moves forward, what is it going to take to financially sustain itself and its initiatives? How can this be easily achieved?* Plenty of healthy dialog followed about the importance of developing a *workable funding model* for CAG, an organization which is presently volunteer-based.



GCSANC Member & CAG President Ted Horton with CAG Meeting Moderator Henry DeLozier of Global Golf Advisors.

In an effort to obtain solid funding, CAG must *communicate its message clearly and proactively* to political leaders and governmental agencies (local, regional and state level) those who influence and/or implement legislation that impacts the golf and turf care industry. Additionally, CAG must expand its membership base by reaching out to those within the industry for their involvement and financial support. It was determined that developing a *strategic plan* would be a logical next step.

As expected, the meeting did not close without proper discussion about the *importance of protecting and managing water resources* for the golf and turf care industry. The DWP Water Task Force (recently established in Southern California) was recognized as a viable model. There was a consensus by those present that more collaborative efforts (like that of DWP and golf) need to be developed within the state. CAG is fortunate to have top technical experts who are willing to lend their knowledge and support, well-evidenced by the DWP Water Task Force. Experts include **Mike Huck, Andy Slack, Mike McCullough** and an array of golf course superintendents, educators, suppliers and vendors throughout the state.

When looking to the *future of CAG*, it also means looking to *the future of the golf business and the sport*. Several CAG members shared their thoughts on the ongoing importance of *promoting the game and the positive benefits it provides* for the citizens and especially the youth of California.



(L to R) Gary Ingram, CGCS; Richard Harris Esq., San Francisco Public Golf Alliance in support of Sharp Park Golf Course and GCSANC VP Glenn Mathews.



Golf industry leaders listen intently during CAG meeting at Sequoyah Country Club. The event was hosted by GCSANC member Terry Grasso (far left).



The GCSANC representation at the CAG Meeting (L to R) Ted Horton, Gary Ingram, Tom Schunn, Gary Carls, Bruce Williams, Emmy Moore Minister and Glenn Matthews.

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