

grow and develop our industry's people and boost their capacity. Investing in and supporting leadership programs is a core tenet of that work. Our industry's crop of leaders continues to grow and develop into effective, passionate advocates for agriculture. This investment serves a few purposes, but a major reason is enabling the development of knowledgeable, skilled, forthright advocates who will stand up and share our story, provide guidance on importance issues, and represent our growers at a local, national and international level.

Cotton Australia sponsors a range of leadership programs in order to bring our commitment of growing and developing our industry's people to life. The programs we invest in include the Nuffield Australia Farming Scholarships, the Peter Cullen Trust Science to Policy Leadership Program, the Australian Rural Leadership Foundation's Australian Rural Leadership Program and TRAIL emerging leaders program, the Australian Future Cotton Leaders Program, and the Represent Your Industry – Leadership Development Initiative.

While all of the above referenced programs have achieved significant results, I would like to particularly highlight two of our leadership programs:

Australian Future Cotton Leaders Program

The Australian Future Cotton Leaders Program is an initiative of Cotton Australia, in partnership with the Cotton Research and Development Corporation. The program is recognised as the premier leadership development program for the Australian cotton industry with up to 15 participants involved over a one year period.

The Future Cotton Leaders program is a national leadership program for Australia's future cotton leaders, supporting individual commitment to creating and leading change in the Australian cotton industry. The program has four key stages:

- Leadership development;
- Individual skill application and project goal setting;
- Leading change; and,
- Contributing to industry.

The program is designed to assist and work with participants to develop, implement and evaluate their own leadership

development project with the ongoing support of a leadership facilitator and industry mentor.

Applications for this program will open at the beginning of 2020, and I look forward to meeting past and present participants of the program later in the year at the Australian Cotton Conference.


Represent Your Industry – Leadership Development Initiative – 2018–20

The Represent Your Industry initiative is a three-year program led by Cotton Australia with funding support from the Australian Government's Department of Agriculture and Water Resources Leadership in Agricultural Industries Fund.

The key goal of the program is to support cotton growers in developing their leadership skills and to enable them to communicate and influence industry change through key topics such as governance, advocacy, strategic thinking and planning, and communication.

The program utilises an integrated delivery platform including a face-to-face forum, and online group and individual activities. A cornerstone of the program is a two-level mentoring initiative that will see an additional 40 growers across regions participate in local knowledge and skill development activities with a current program participant.

In 2019, the focus was on the Cotton20 Leadership Program; while in 2020, the program will expand into the Irrigation20 Leadership Program and involve growers from other irrigated industries. I encourage anyone interested in finding out more to email cotton20@cotton.org.au.

It is through programs like these that our industry will continue to build in strength and capacity. Our passionate ensemble of leaders strengthens our cotton communities through the valuable initiatives they help drive. They help advocate for our industry, share our story, and encourage others to achieve their best. It is through their contributions and leadership styles that Australian cotton will continue to thrive for years to come. I thank all our industry's leaders for their efforts this year, and Cotton Australia looks forward to continuing to work with them into the future. 

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An alternative to a long held fallacy of long fallow

■ By Oliver Knox¹, Yui Osanai¹, Katherine Polain¹, Farzad Aslani¹, Peter Lonergan¹ and Gupta Vadakattu¹

Beliefs come first, explanations for beliefs follow (Holt 2011)

SOMETIMES things change and when this happens it takes some of us longer to come to terms with it than others. This is partly because the beliefs we develop can form in the absence of evidence. To compound the issues, when we establish beliefs, our brain sets up a series of connections associated with the release of dopamine. Turns out we really like dopamine and so when our beliefs are challenged our brain works out a way to make the challenges align with our existing belief system and, in doing so, releases more dopamine. So, while we can teach an old dog new tricks, it is hard to alter its belief systems, but not impossible.

The belief

Long fallow disorder occurs when plants are observed to grow poorly following periods of fallow. The disorder was associated with low densities of arbuscular mycorrhizal (AM) fungi (see photo) back in the 1970s and 80s with the proposed theory being that the propagules of the AM fungi reduced over time. In some subsequent experiments, plant growth was shown to recover when AM are added to the system and so the belief that AM and long fallow were connected was established.

Does the evidence support this?

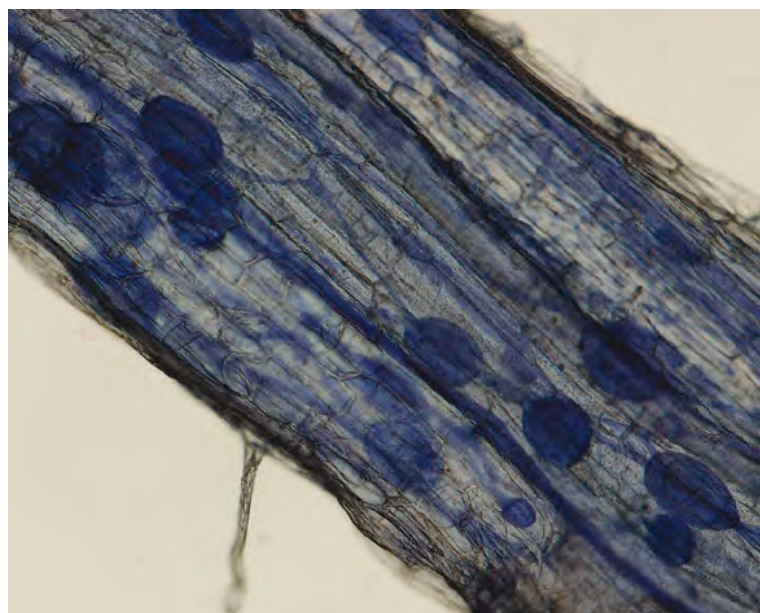
This all seems quite convincing. Our issue has a suspect and it looks pretty guilty, but is it the whole truth? Many of those early experiments used fumigants to remove AM fungi from the

soil. These included methyl bromide, which is also an effective herbicide, rodenticide, nematocide, insecticide, bactericide, and fungicide – so it removed a lot more of the soil biology than just the AM. Isn't the other biology in the system important as well?

Of course it is. Now reflect on the work of John Brown, Stephen Allen, David Nehl and Nilantha Hulugalle in the 1990s and early 2000s. Their experiments indicated that environmental factors, other than AM inoculum, were responsible for poor colonisation and growth. One of these other factors was root browning bacteria. Finally, work by these gentlemen, as well as Peter McGee and Greg Pattinson, showed that prolonged periods of dry conditions had no effect on the density of AM propagules in soil. These experiments ranged from 18 month lab trials to 7 year field trials and made them conclude that both cultivation and frequent wetting and drying cycles (six saturation to dry events over 18 months) were needed to reduce the AM. They concluded that factors, other than a decrease in AM propagules, were involved in long fallow disorder and that more work was needed.

So why the continued belief?

Well, first off, long fallow disorder does appear to be associated with a reduced colonisation of the roots by mycorrhizal fungi. We now know that this is not due to a lack of inoculant, but the exact cause remains elusive and so we cling to our beliefs. Secondly, we are in a drought and there are again concerns that prolonged periods of fields devoid of crops will reduce the AM fungi. But few of us have experienced any, never mind several, wetting and drying cycles in this drought so, if we trust the science, then the AM fungi are still there. So don't panic. Third and finally, we've never had anything else to blame long fallow disorder on, but perhaps we can change that?



A cotton root that has been cleared and stained. The dark oval structures in the root are the vesicles of AM fungi that have colonised the cotton. Colonisation of cotton, like this, remained similar across seven years of sampling of a field that received no rain during the millennial drought.

AT A GLANCE...

- Long fallow disorder is real. But a lack of AM colonisation is a symptom of the disorder and not a cause. Long fallow disorder is likely due to all members of soil biology competing for organic matter and nutrients when we break out of drought and being better at this than plants.
- AM propagules survive well in soil, as long as there are no wetting and drying cycles. Most of this drought has been dry, so even cultivation is unlikely to affect your AM numbers.
- Weeds or cover crops could help your AM fungi, but they will also feed your other soil biology. Overcoming long fallow is likely to involve helping all members of the soil biology.
- Keeping fields clean in a drought is BMP when it comes to weeds, but a cover crop planted on enough moisture to emerge and establish may assist with erosion, water infiltration and maintaining or improving your soil biology. Perhaps give it a go.