

Newsletter

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Multi Species Cover Cropping workshops

Goulburn Murray Landcare group & Goulburn Broken CMA



www.stipa.com.au

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STIPA is not an acronym. The association was named after the *Stipa* genus of grasses, now *Austrostipa*. One of the *Stipas* is commonly known as spear grass. At its inception in 1997, the association aimed to spearhead a change in attitude to native grasses. As that change is occurring, Stipa continues to promote the use of native grasses to achieve profit from a healthy landscape.

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From the Chair

Michael Gooden

Welcome to the summer edition of Stipa newsletter. How no two years are the same, 2017 was one of those years that could not have been scripted if you tried. For us in the Riverina, we were coming out of a record wet year in 2016, into a long hot summer, brief autumn break, that turned into a dry winter and potentially failed spring, until at the 11 hour we got three months of rain in two weeks, and everything has taken off again. In my mind the two points this really showed to me was the value of planned grazing and also having plants that will respond to rainfall at any time of year, as we have no control over when and how much it rains.

Graeme and Col have had a busy year teaching the Pasture Cover Cropping courses, this has been great for Stipa as an organisation to increase member numbers and increase awareness about the importance of managing for a regenerating perennial grassland. Hopefully there are a few more in the pipeline for 2018.

I have first-hand experience with



some cover crops this summer, after two somewhat failed attempts at autumn sowing of cool season grasses, we have had success with some warm season summer cover crop of Millett, Sorghum & Cowpea. The crop is progressing well, and the paddock is now in our grazing plan to be grazed in March. Just like Gabe Brown said on his tour in 2016, if it doesn't work the first time you must be doing something right!

I personally thank Graeme and Col for the work that they do to promote Stipa as an organisation, we would not be in the position that we are in today without their contribution. I wish you all a prosperous 2018, may you plan well, graze well and most of all enjoy what you do.

From the CEO

Graeme Hand

In this report

- Annual General meeting report
- Regenerative vegetable production
- Multi species cover cropping workshops
- Update on Annabel's progress

Annual General meeting report

The AGM was held on 23 November 2017. Key points from the AGM were the election of Michael Gooden as Chair/President. The executive would like to thank Michael for stepping into the role of acting chair and now elected chair at short notice.

Regenerative vegetable production

included in this newsletter is an article in designing regenerative vegetable production. Colin Seis and I have put this together to raise the issue. Vegetarianism and veganism is a big topic now and people with very good intent are shifting to these food systems partly to stop degradation of biodiversity. This article is an attempt to clarify designs that will regenerate our life-support systems.

Multi species cover cropping workshops

As previously reported, Stipa has developed and run the first multi-species cover cropping workshops in Australia. These workshops have been successful as each farmer goes away with a



Photo By Lucy Hand

recommended cover cropping mix, machinery match and weed control recommendations to establish their cover crop. Follow-up meetings are based on grazing and terminating these cover crops as well as options for the next season. Let me know if you would like to run a workshop series in your area. These workshops usually require co-funding from NRM bodies to make them work, but we can design other options. Please see article in this newsletter for more details.

Update on Annabel's progress

Colin and I travelled together to co-present with Christine Jones at the Digging Deeper Soil Biology Forum 2017 - Natural Resources SA (Murray-Darling Basin). As we went through the Adelaide Hills we called in to see Annabel and Ken. It was great to see Annabel and Ken, and we had a very relaxing cuppa on the veranda chatting about all things Stipa and what we had all been up to. Annabel was elected onto the Stipa Executive committee at the November AGM.

Designing regenerative vegetable production

Graeme Hand

Key points:

- Current vegetable production is clearly unsustainable as it requires off-farm carbon inputs, high fossil fuel use as well as herbicides, insecticides and tillage leading to biodiversity loss producing significant soil loss and soil degradation.
- Growing vegetables in dormant perennial grasslands (Pasture Cropped multi species vegetables with Planned Grazing) is part of the solution
- Multi-species cover cropping with Planned Grazing also has a big role to play.

Discussion:

Current vegetable production needs to be redesigned¹. Most of the industry focus is on improving the efficiency of the current model (technology based) and substituting inputs (compost etc.) but only a deep redesign² so that vegetables are grown in a system that is self-regenerating will we be able to produce nutrient dense vegetables long term.

Much of the advice to reduce soil erosion and degradation only suggests practices that slow down the damage³. Going over the cliff slowly does not make sense and this non-solution only pushes the problem onto our children and grandchildren.

The cause of the degradation is lack of ever-increasing landscape function⁴ - stability, nutrient cycling and water infiltration. Increasing nutrient cycling by growing litter in place seems to be the only sensible (practical, profitable & low fossil fuel use) design to restore vegetable nutrient density.

See - Factors impacting nutrient cycling (page 11).

The evidence base is clear that for farming to be regenerative in the long run requires that perennial grasses need to be the base of all systems⁴.

Perennial grasses are required to maintain soil structure, biodiversity, soil organic carbon and nutrient cycling^{4,5}.

Multi species cover cropping vegetables is a giant leap forward⁶ but as Dwayne Beck, Research Manager at Dakota Lakes Research Farm in Pierre, South Dakota (leading US Scientist in no till and cover cropping) describes, this design can result in too much nitrogen and not enough carbon as well as the need for perennial grass roots.

The closest design he has seen to a long term regenerative cropping design would be Pasture Cropping based practices⁵.

Impact of practices

Table 1 is an attempt to describe the impact of different vegetable growing practices. See page 10

Examples of practices:

The lower practices are degrading, so I will not provide any examples below level 4.

Level 4 Example

Gabe & Paul Brown work at this level with great success. They plant potatoes and other vegetables into the decomposing litter from previous cover and cash crops. Sometimes potatoes are planted into compost and then covered with hay See photos. The Brown's share their economics which show that vegetable production is very profitable. This income is achieved through direct marketing of nutrient dense produce that brings customers back.

Barriers to adoption

Relies on excellent soil health and structure from a commitment to increasing landscape function. The Browns achieve this through multi species cover crops and excellent ultra-high-density grazing

management to promote decomposing litter in all their grazed and cropped areas - perennial grass, multi species cover crops and cash crops. It is the decomposing litter that produces the conditions that increase fungal content. Increasing fungal content increases nutrient cycling, water infiltration and stability. Harvesting can be labour intensive. See photos. There are also many YouTube videos of Gabe and Paul presenting.

For more information see <https://nourishedbynature.us/> and <http://brownsranch.us/>.



Potatoes being grown in compost over a multi species cover crop and then covered with hay. Harvested by rolling back the hay



Multi species vegetable production deep decomposing litter base

Source: Presentation by Gabe Brown—Grazing Cover Crops and benefits for livestock producers.

Level 5 Example (the highest known level of regenerative agriculture)

Colin Seis works at this level. Col admits it is early days but the signs are that this is a viable way of broad scale production of vegetables without erosion, while increasing nutrient cycling and water infiltration.

Barriers to adoption

Key barrier is having a climate and grassland that has a clear dormancy period. These techniques rely on not killing perennial grasses but waiting until they are dormant or forcing them into dormancy with grazing management or herbicides that do not kill perennial grasses⁶. Small safe to fail areas trials are required to develop expertise in this technique. Please see article on practice areas

Summer growing grassland (species examples: Redgrass, Kangaroo Grass, Box grass, African sub tropicals)

A summer growing grassland that shuts down with frosts and cold winter temperatures is a good example of a situation where these techniques work well. It is harder to develop a niche in a summer grassland where the winters are mild and may require herbicide.

Winter growing grassland (species examples: Weeping grass, Wallaby grass, Spear grass, Phalaris, Cocksfoot, Perennial Ryegrass)

A winter growing grassland can be manipulated to go into dormancy in the summer but years with high summer rainfall or irrigation can result in growth and competition and may require practices from level 4.

Possible vegetable species that could be planted into different grasslands

Summer growing grassland

Possible winter growing vegetables (while summer growing grasses are dormant or growing slowly)

Brassicas eg broccoli, kale, peas, faba beans, turnips, swedes and parsnips

Winter growing grassland

Possible summer growing vegetables (while winter growing grasses are dormant or growing slowly)

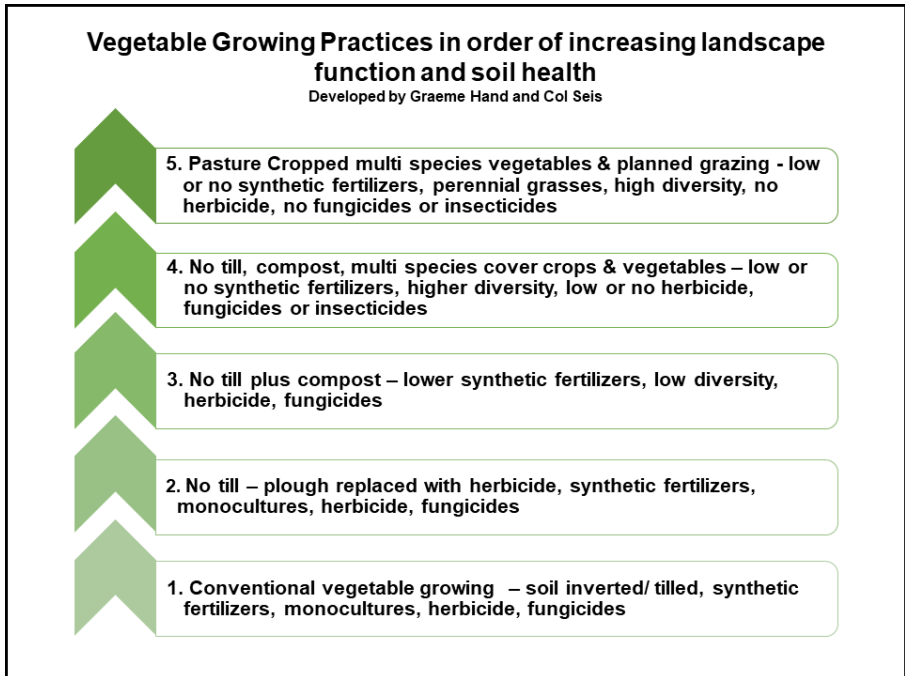
Potatoes, tomatoes, pumpkins, melons, capsicum, cucumbers,



zucchini.

Winter growing broadleaves in a dormant summer growing grassland. Photo Colin Seis

Table 1



References:

1. Soil Erosion Threatens Food Production David Pimentel * and Michael Burgess College of Agriculture and Life Sciences, Cornell University, Ithaca, NY 14853, USA; Agriculture 2013, 3, 443-463;
2. From Shallow to Deep Organics: Redesigning our Agroecosystems for Sustainability and Wellbeing, Professor Stuart B. Hill, University of Western Sydney – October, 2009
3. Managing soil erosion in vegetables, fact sheet 2, Department of Primary Industries and fisheries, Queensland government
4. Landscape Function Analysis, Tongway & Hindley, 2004
5. Dwayne Beck / Buzz Kloot <https://www.youtube.com/watch?v=kAE8C3Vr8Zo&t=1s>
6. Browns Ranch <http://brownsranch.us/>.
7. Winona - <http://www.pasturecropping.com/pasture-cropping>.

Factors impacting nutrient cycling

Indicators that show you are increasing nutrient cycling on your land are:

- Increasing cover of perennial grass bases (basal cover).
See photos
- Increasing litter cover, depth and degree of decomposition of this litter.
- Surface roughness – rougher surfaces hold litter and water in place
- For completeness, I need to mention cryptogam cover which has a small impact on nutrient cycling but does not provide animal feed or litter production



Photos are of Redgrass (*Bothriochloa macra*) based native perennial grasslands managed differently.

80% Perennial grass basal cover



~10% Perennial grass basal cover

Wurdi Youang

In November 2017 Colin and I gave a presentation to the Wathaurong Aboriginal Co-operative at their Little River property, Wurdi Youang. There were other farmers and native grass people present as well as CMA and DEDJTR staff.

This site is very significant, and it is estimated that it is the oldest astronomical observatory in the world. See below

The short presentations on the work and history of Stipa were followed by a paddock walk and discussion of ways to regenerate the cropped and degraded grasslands. The day was very relaxed with lots of good humour and deep discussion.

We would like to thank Valerie Little, Aboriginal Landholder Information Service Project Leader and Gabrielle Brennan from Agriculture Victoria, for organising this day.



Paddock walk at Wurdi Youang

Wurdi Youang cont.

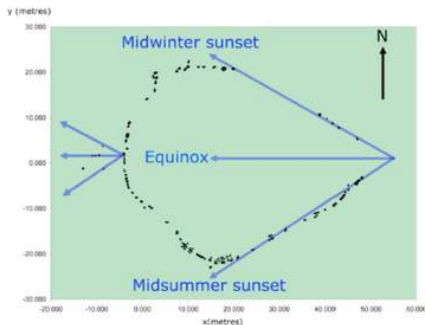
Astronomical hypothesis

A series of stones, located to the west of the arrangement's western apex, are claimed to mark the positions of the setting sun at the equinoxes and solstices. A survey study shows that these alignments are accurate to within a few degrees.

Additionally, the straight sides of the arrangement, which diverge from its eastern apex, also indicate the setting position of the sun at the solstices to within a few degrees and at the equinoxes the sun sets over the three prominent stones at the apex.

It has been suggested by scientists studying the arrangements that it could be as old as 11,000 years (based on carbon dating at nearby sites), which would make it the oldest astronomical observatory in the world.

https://en.wikipedia.org/wiki/Wurdi_Youang



By Source (WP:NFCC#4), Fair use, <https://en.wikipedia.org/w/index.php?curid=38675934>

A recent visit to our place, at Branxholme, by a member of the cooperative, demonstrated how we use grazing management to regenerate perennial native grasslands.

Practice areas

Graeme hand

Practice areas are crucial in working out which farming practices will regenerate your perennial grasslands which then enable regeneration of your soils and increase biodiversity. To deal with the complexity of agriculture, we need to get high-quality, timely feedback. Relying on advice from agronomists and consultants based on trials that have been carried out on different soil types, in different environments and at different levels of brittleness, fails in the long run.

As discussed in previous newsletters most advice is focused on increasing production rather than increasing your profitability. Increasing production through increasing stocking rate and area cropped has been shown by Dr Tim Hutchings to increase risk resulting in lower profitability over the next decade. The cause of this reduction in profitability is greater exposure to higher debt, rainfall variability and price volatility.

Safe to fail practice areas

Recently I've been studying Dave Snowden from Cognitive Edge¹ who states that we need to implement a portfolio of at least five 'safe to fail' trials.

Safe to fail trials are ones that do not put the business at risk and even if they fail completely, the information and learning was worthwhile. All leading regenerative farmers that I have met or know have annual, safe to fail, trials.

At least 20% of the trials must fail to determine the boundaries of what works for you on your farm. For example, we still maintain trials that have perennial grass recovery that is too short, too long and animal impact that is too low to maintain a highly functioning perennial grassland. Gabe Brown includes in each presentation the comment that if they are not failing something each year they are not learning.

Practice areas (cont.)

Graeme hand

One of these trials needs to be oblique (trying to fix one problem by concentrating on another) and if possible, one should be designed by people that do not know or understand agriculture which Dave Snowden describes as naïve. The key to using a portfolio of trials is not to pick the one that is right but to use the information from each of the trials to determine your best course of action. This process allows us to nudge management in the direction of lower risk and higher profit while regenerating perennial grasslands and soils.

Planned Grazing practice areas

We have been helping people set up small safe to fail practice areas to determine the combination of perennial grass recovery followed by animal impact/grazing that is required to regenerate their grasslands and soils. These trial areas are usually grazed between 5000 to 10,000 DSE per hectare for a couple of hours. We started using higher stock density (10,000 DSE per hectare) after reading Johann Zietsman's, book Man, Cattle and Veld.

I did not believe that increasing stock density from 5000 to 10,000 DSE per hectare would make a large difference even though Gabe Brown, Neil Dennis and others have been recommending for many years.

Making sure I took my own advice of never taking advice, we implemented a few trial areas and quickly realised that a step change in utilisation and animal impact occurs between 5000 and 10,000 DSE per hectare.

Barriers to adoption

Putting this into practice is inconvenient (5-6 shifts per day). We are currently investigating ways of overcoming some of the structural barriers by using narrower laneways and tools like Batt latches.

Practice areas (cont.)

Graeme hand

Animal performance can suffer under this management, and we are selecting for animals that thrive at this stock density. The criteria for selecting such animals seem to be positive fat, lower milk production, moderate to smaller frames (US Angus estimated progeny difference Cow \$En), high appetite and foraging ability as well as the ability to cope socially competing in a tight herd or flock.

Our best estimate, based on experience and discussion with others is that 90% of heifers or cows born and bred under conventional management will not last more than 2 years under ultra-high stock density, planned grazing. The second generation usually last longer as evidenced in research by Fred Provenza (local adaption).



Example of a practice area. Same animal impact with double the recovery to the right of dog.

Practice areas (cont.)

Graeme hand

Multi Species Pasture Cropping practice areas

Col Seis usually runs a few practice areas each year. Some examples include with and without oats, lower toxicity, desiccant type herbicides to find options that do not kill perennial grasses or people and different varieties of broadleaves and legumes.

Multi Species Cover Cropping practice areas

Part of the design aspect of the Stipa Multi Species cover cropping course is to determine the scale of a safe to fail trial. One of the Tatura participants was happy that we convinced him to reduce his first multi species cover crop from 400 ha to 100 ha.



Example of practice area for sheep.

Before: grass fence high and lots of litter in the base of the perennial grasses



During: sheep grazed for about 3 hours.



After: 100% ground cover. Litter on the soil surface ready to be colonised by soil biota increasing decomposition.

Membership renewals

Please note

Stipa is changing the way they renew memberships. We will endeavour to mail/ email out your renewal tax invoice one month prior to your expiry date. If you would like to renew please mail us a cheque or EFT your membership.

Please remember to make reference on all EFTs and return cheques your **INVOICE NUMBER** (found on the top of your Stipa tax invoice).

Attention all members

To ensure that you continue to receive Stipa newsletters and updates, please remember to advise us of any change of email address.

Also if you wish to receive emails about forthcoming events and other matters of interest, it is important that we have your correct email address.

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