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WICCNews

WICC Newsletter April - May 2020



Djeran

Season of adulthood - time to repair housing and shelter



Osprey at Morley Beach - Photograph by Michael Dolphin

Farmers in focus





Manjimup Farmer Doug Pow



Cow eating Bio Char

Doug Pow is a beef cattle and avocado farmer south of Manjimup. Doug has been doing some innovative things with biochar and dung beetles that has other farmers looking over his fence. WICC caught up with Doug to find out more.

WICC: "What have you done with biochar and dung beetles on your farm?"

Doug: "Originally, I devised and tested a method of biological carbon sequestration to see if it would work and could be done as part of a farming system at a profit. This was in 2011 when hundreds of millions of our dollars were being spent on carbon capture and storage for the coal power industry. That was totally uneconomic, my biological system is still going and profitable in many more ways than I envisaged at the time."

WICC: "What benefits have you observed? Does it make sense financially?"

Doug: "Stable elemental carbon - biochar - was eaten readily by our cows and buried along with the dung, after passing through the ruminant gut, by our local suite of dung beetles. These had been introduced decades ago in the Australian Dung Beetle Programme by CSIRO and a later introduction by Dairy Australia and the WA Dep't of Agriculture.

Once in the ground testing was performed on both the biochar and soil by Professor Stephen Joseph of UNSW engineering. We are engineering a different soil. There are profound effects on the soil fertility imparted by the biochar particles, activated by passage through the rumen and association with the reactive clay particles. These effects are both permanent and cumulative as biochar is continuing to be deposited around the farm by the cows. Different beetles are active at different seasons of the year and they bury dung as a food supply for their offspring, brood, at different depths. A very positive side effect of having a complimentary suite of dung beetles. There is currently another dung beetle importation programme active to fill gaps in the seasons and soil types with new beetles.

Economic benefits have certainly flowed on from this experiment, which has become our standard practice. We changed calving time, late summer to late winter. We cut out feeding hay. We tested soil nutrient status annually and have stopped spreading superphosphate as the soil P level is still increasing and is ample. Locked up P is being made available. We cut out drenching for worms and spraying pastures with insecticides. Cutting out the poisons is the most important point for survival of a beetle population on a farm. This saved considerable farm costs. Cattle sale prices and stocking rates have hardly changed. The pasture has steadily become more legume dominant with a definite benefit to the cows.

There is a reduction in enteric methane production from the cows and a corresponding increase in

food conversion factor by having a small amount of biochar in the rumen. It is because of a change in the gut biology. No inoculation with new bugs is necessary as they are in the pasture and soil and picked up by the grazing cows.

In short my experiment has become farming the dung beetles, with the cows just being rotated around the farm with adlib biochar and a trace element lick."

WICC: "How do you know that it is the biochar that is delivering the benefits? Will it work for other plants?"

Doug: "Following on from the results of soil testing the biochar amended pasture... I devised an experiment using biochar, this time raw from the kiln, incorporated into the soil of our orchard before planting two more rows of avocados. Three rates were chosen, by guesswork, too much, just right and not enough! I was attempting to decrease the bulk density, and increase the aeration and drainage of our soil to be more like the light volcanic soils in which avocados evolved in Central America. We have no pumice supply so used biochar. After five years, much testing and two commercial crops, it is evident that the trees in biochar grew much more vigorous root systems, thicker trunks and have produced much more fruit on the same water and fertilizer. It seems the main attribute of the biochar incorporation has been an increase in biological activity leading to a large increase in soil carbon. I feed the soil carbon by applying an annual application of forestry wood waste, mixed with a little chook litter to prevent nitrogen draw down, on the soil surface. This is decomposed slowly, over years, primarily by fungal activity. The humic material produced from this slow decomposition seems to be captured and retained by the biochar in the soil below. The soil carbon increases by more than the sum of the carbon from the biochar and the wood waste, a process now named 'positive priming'! The cost of the biochar is only once and it seems our rates have been unnecessarily high. The yield and fruit size increases have certainly far outweighed the outlay on biochar. In this district most tree crops have now been planted into soil amended with biochar.

A planting of olives, in almost pure laterite gravel amended with a small amount of biochar, very close planted for mechanised hedging and harvest is remarkable in that it is carrying approximately one tonne of fruit to the hectare after one year! The biological organisms in soil, especially fungi and the plant roots themselves certainly seem to have a definite affinity for biochar particles in the soil. In our case an association with the soil clay component seems to be important. I don't know about a sand without clay."

WICC: "How can biochar be accessed on the south coast?"

Doug: "Ours comes from a silicon smelting operation in Bunbury, where it is produced, in house, in great quantity from jarrah as a reductant, like the coke in an iron furnace. We get to buy the material too fine for their process. High freight to the south coast, though.

In future most biochar, in my opinion, will be produced as a byproduct of gasification of wood. This gas, as a replacement for LPG, has a high value allowing the co produced high quality biochar to be quite affordable to agriculture. There is a continuous plant like this already operating in Mt Gambier in South Australia heating a glasshouse operation and producing 3000 tonnes per year of biochar. There is plenty of wood waste in our SW."

To learn more about Doug's biochar trials and the benefits it has delivered for his avocados see the

academic paper below...

Elsevier Editorial System for Science

Avocado Paper

Keeping the P out of our inlet



John Grant (DPIRD) helping farmers Rodney Drage (L) and Mark Bailey (R) to interpret their nutrient maps

Our Australian landscape is some of the oldest exposed surface on the planet. It has been exposed to the elements for millions of years. In the absence of volcanic activity, our surface soils are leached of many nutrients, especially Phosphorous (P). Australian native vegetation has learned to cope with this. Many families of our native plants, like Proteaceae (think banksias), are intolerant to high levels of P as they have had to learn to evolve without this basic nutrient which many other plants around the world thrive on.

This posed a dilemma for our early farmers. When the land was first cleared of our towering trees, it was assumed that pastures would thrive. If the soil could grow 50 metre karris, surely it would grow grass. It didn't.

It wasn't until the application of phosphate (originally in the form of guano) that we could grow pasture in our catchment. The government even lent a helping hand by subsidising superphosphate for our farmers. This made farming viable (once we sorted out our trace element issues). Since the mid 20th century we have applied copious quantities of P throughout the catchment. Much of this has banked up in our soils (especially in our loamy soils). Many land managers are still applying P at unnecessarily high rates and it is affecting our waterways. In fact, nutrient mapping by the

Department of Primary Industries and Regional Development (DPIRD) has shown that approximately 80% of our paddocks have more P than required to grow adequate pasture. Nowadays, our pasture growth is seldom limited by P, but rather other deficiencies such as acidity, sulphur or trace elements. Applying P when you don't need it is not only a waste of money, but the excess P leaches into our waterways causing environmental issues.

To assist our farmers, DPIRD and WICC and the Department of Water and Environmental Regulation (DWER) have been carrying out nutrient mapping throughout the catchment so farmers can discover how to maximise their pasture growth and minimise their nutrient loss to our waterways. Since 2016, through the Royalties for Region's Regional Estuaries Initiative, nearly 100 farmers throughout our catchment have had their farms nutrient mapped and attended workshops to learn how to target their paddock needs. WICC has carried out surveys with the farmers pre and post involvement in the program and the results have been amazing. Participants are now using evidence based data to manage their pastures and have largely cut back on their application of P. This is a win for the farmers bottom line and our waterways as well.

If you would like more information about soil testing please contact WICC at info@wicc.org.au.



Another tool to reduce nutrient export from agricultural land is ensuring that fertilisers spreaders are as efficient as possible.... and farmers know what is coming out the back of their machines.

About 20 farmers attended the Sounness farm in Denbarker to calibrate their fertiliser spreaders. Maximising the efficiency of your spreader not only saves farmers \$\$ but also helps limit the amount of fertiliser entering our waterways. Thanks to the Department of Water and Environmental Regulation for funding this event under the Regional Estuaries Initiative (and a big thanks to the Sounness family for use of their paddocks and shearing shed).



Farmers learn what their spreaders are actually doing (note: this workshop was held prior to current Covid-19 social distancing guidelines)

Weeds in focus





Blackberries (*Rubus anglocandicans*, *R. fruticosus*, *R. laudatus*, *R. rugosus*, and *R. ulmifolius*)

Blackberry is a perennial and semi-deciduous prickly weed that most of us are familiar with, often forming dense thickets on or near waterways.

Begin control measures only if you have plans to return for at least three years in a row. It is recommended to spray during summer growth, or manually remove anytime during the growing season. Manual control can be achieved on small infestations, especially in natural bushland, and larger infestations along waterways where spraying is not permitted.

Metsulfuron plus Pulse is one of several spraying options. On larger infestations it can be used before the more expensive Grazon that has little effect on grasses. If you are using chemicals, use no more than recommended by the manufacturer (it won't make it any more effective). Surfactants (like Pulse) are harmful to our frogs. Good rule of thumb is "if you hear croaking don't use surfactants".

Goats have proved effective at control so long as in well secured enclosures.

Rusts have turned up and been experimented with in our region but their usefulness is seemingly dependent on specific seasonal weather conditions being met.

Contact WICC if you would like us to recommend a good chemical contractor.

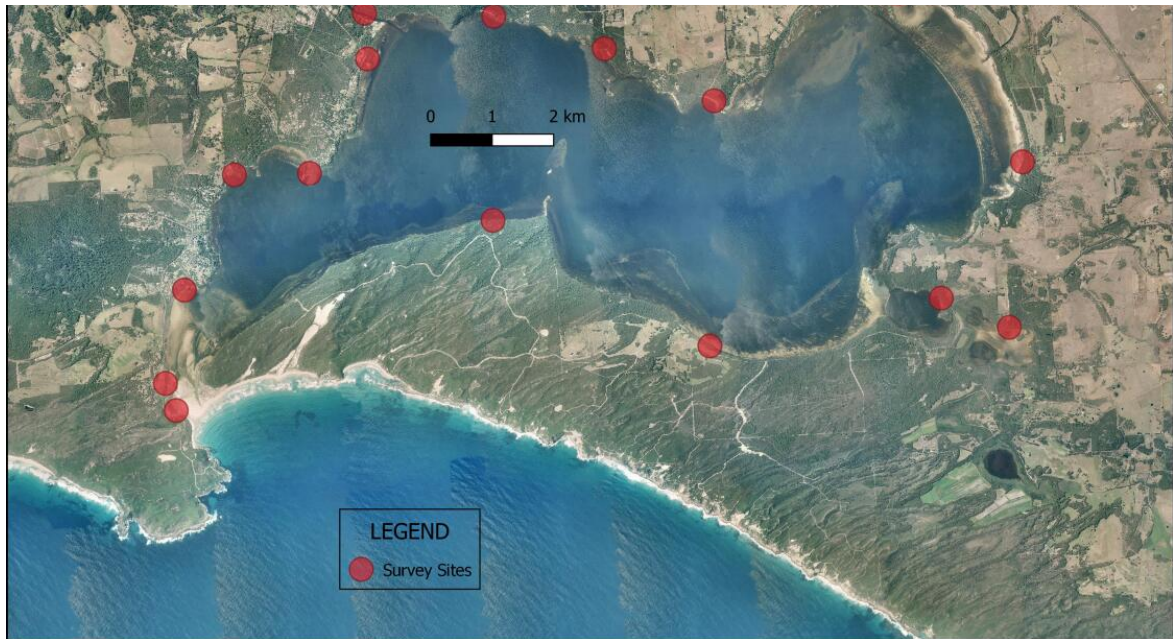
Inlet Update

The lungs of Wilson Inlet (and all estuaries for that matter) are the fringing foreshore vegetation (riparian). Healthy riparian vegetation minimises erosion, provides fauna habitat and strips excess nutrients from entering the inlet by utilising those nutrients in the growth of further vegetation. This helps to mitigate excess nutrients from entering our inlet, thus helping to limit excess algal growth.

Riparian vegetation is under constant threat from weeds, clearing, seasonal inundation and foot traffic.

Since 2011, WICC has been carrying out foreshore flora surveys at 19 sites surrounding the inlet to help ensure our riparian flora can continue their vital function.





Wilson Inlet riparian monitoring sites

These surveys help to inform our revegetation efforts and will be a valuable tool in determining the implications from rising sea levels and non-openings of the inlet.

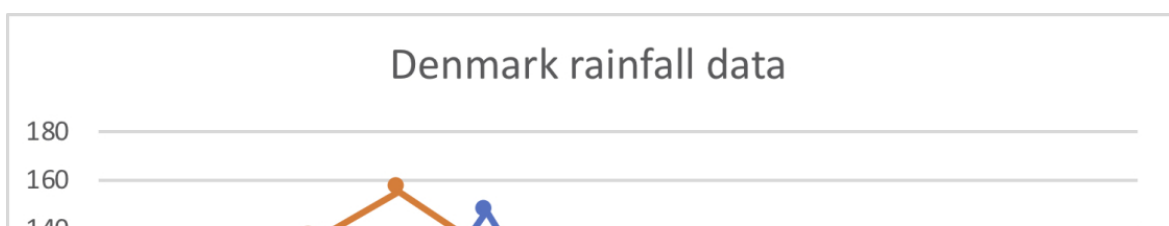
Surveys are being carried out this April. WICC would like to thank the Shire of Denmark for their ongoing investment in this program.

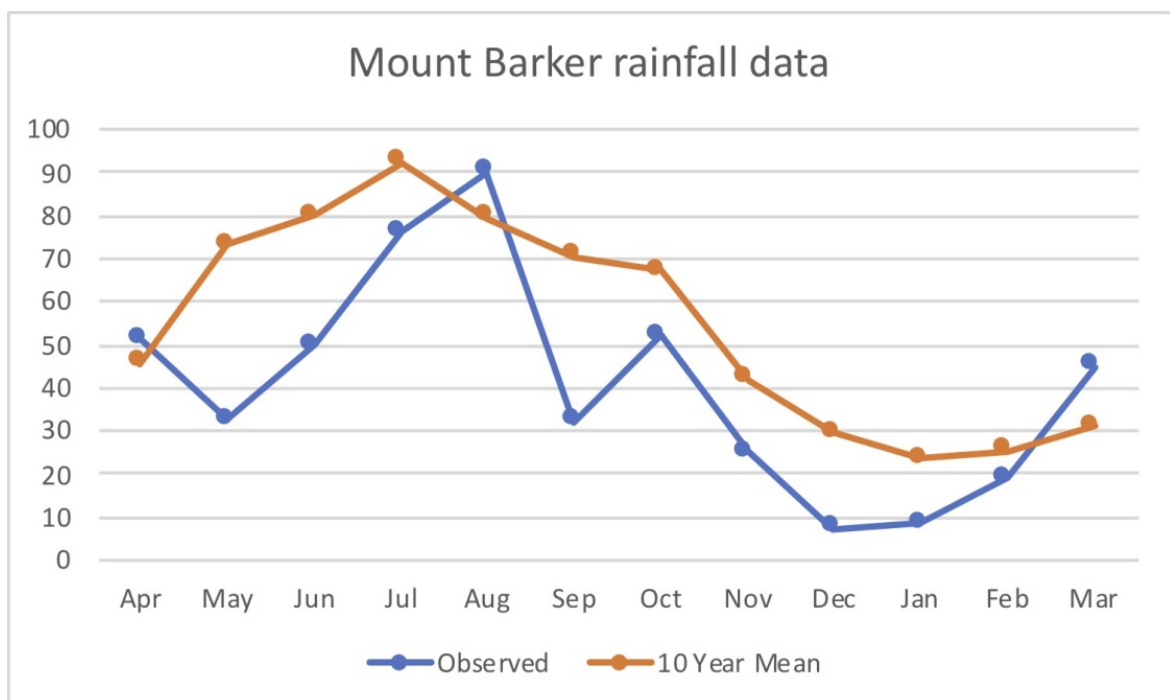
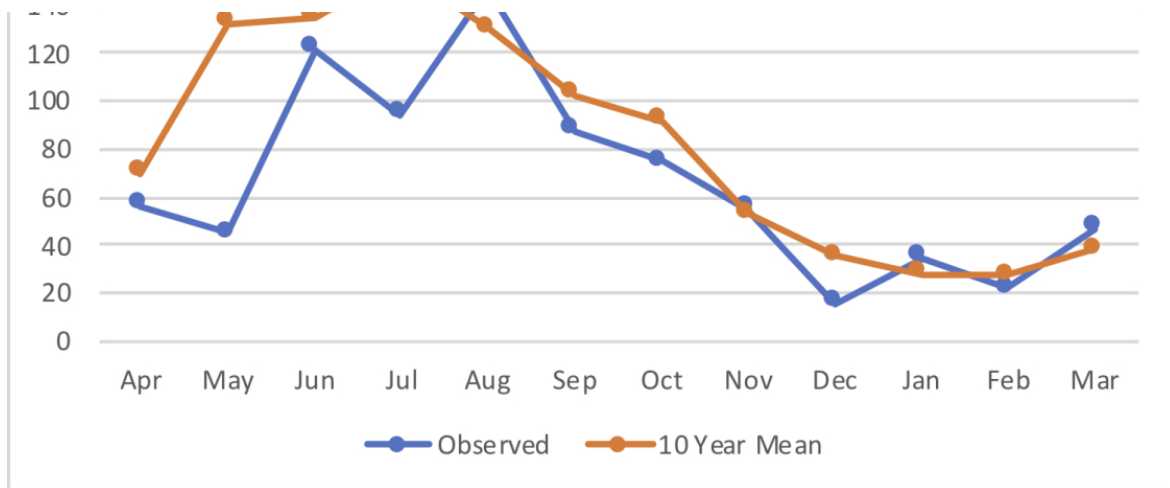
Rainfall Update

The last couple of months have been better than average, especially in the upper catchment. Going forward, the Bureau of Meteorology is predicting an above average rainfall for March and April 2020 for our region.

With the two main climate drivers in Australia likely to remain neutral over the next months they will have limited influence on Australian weather and climate through Autumn.

Due to above average sea surface temperatures across northern Australia and parts of the eastern Indian Ocean, this may actively enhance northwest cloud bands, stretching from the northwest of the country down towards the southeast. These extensive layers of clouds can interact with mid-latitude weather systems, such as cold fronts and cut-off lows, and produce widespread and heavy rainfall.

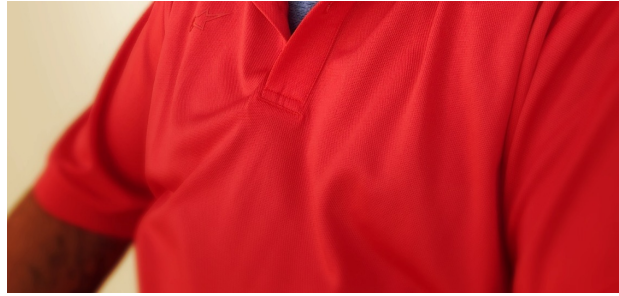




A message from our Elders

WICC recently caught up with local Minang Elder, Aden Eades to get a better idea about how different Noongar groups interacted, traded and moved through our local landscape. Aden has family connections from Esperance across to Nornalup. Aden's great grandmother, Margaret 'Maggie' Picket was born in Nornalup (place of the Tiger Snake). Maggie married one of the early Denmark settlers, John Penny.





Minang Elder Aden Eades

Aden: “My great grandmother grew up around the Nornalup area and spent much of her time around a camp they had set up near the current Nornalup bay there, which they called Deep Creek at that time.”

WICC: “Where were the borders for the different tribal groups?”

Aden: “The Pibbulman and Menang mob mixed between Nornalup across to Windy Harbour. Beyond the Pibbulman you had the Wadandi from maybe Windy Harbour, Lake Jasper onwards to Margaret River. Nobody ever sat in one place in those times. They didn’t have any time to waste. People from the different tribes met up, cause they didn’t believe in interbreeding. You could not marry blood relations so tribes did visit each other for that purpose. Just to keep the line pure all of the time. Like now, we have different blood in us. Look at me, I have white grandfathers.”

WICC: “What about the importance of waterways in Noongar culture. How did that govern movements?”

Aden: “Noongars used to catch up near the waterways where the different tribal groups joined. The Noongars always followed the rivers around. They were very important. In those days they were all fresh water. They would camp around the rivers as long as there was plentiful food. The river from the Nornalup goes all the way up to Lake Muir. The young fellas would be looking for a partner and the young girls would be playing hard to get.”

WICC: “Besides the purpose of marriage, why would tribal groups meet up?”

Aden: “They would have traded ochre. Anything they were short of in one area they might have had in plenty over there. You would trade skins. Possums, roo and chuditch (wester quoll). They needed to have something on to keep them warm. They also met for corroboree and dance. There were always some interactions throughout the year. There are a lot of people that say that Denmark was taboo to Noongar People. I don’t believe that. Our mob was right through that whole area.”

WICC: “The Noongar tribes went up and down the coast, what about going inland?”

Aden: “The river goes from Nornalup and goes right through up to Lake Muir. The lake system around Lake Muir goes all the way up to Cranbrook, I am sure there was trade and marriage exchanges. They walked a long way. Not like I do now in my car. Noongars had a nomadic life. While Noongars moved all around the coast the inland groups would come to the coast in the warmer months for fishing and people would head inland in winter months to shelter from the weather.”

WICC: “What about some of your childhood memories. What stands out?”

Aden: “My grandmother was huge in my life. My grandmother used to take us, when my grandfather was out working, she would take me out with a digging stick to spear rabbits out of

their warrens. She was out in the paddocks digging up mallee roots right into her old age. Her and her two sisters. And hockey. We played hockey a fair bit in those days. We would bend the wood to get the shape of a hockey stick.”

WICC is holding a gathering of Minang and Pibbulman Wadandi Elders at Kwoorabup Park (Adventure Park) to allow Elders to share stories for us to learn more about Noongar culture. The event has been postponed to a later date - check out upcoming events for information or visit us at www.wicc.org.au

Wandju Wandju
Koorabup Beelia

An invitation to listen to Noongar Elders share stories on the banks of the Koorabup (Denmark River)

For thousands of years the Nullaki (Wilson Inlet) has been a traditional meeting place between the **Pibbulman Wadandi & Minang Noongar tribes.**



Elders will share stories of Nullaki, the Beelia (rivers) & Boodja (land)
Special guests, Wayne 'Wonitji' Webb (Pibbulman Wadandi) & Vernice Gillies (Minang)

Where:
Kwoorabup Community Adventure Park

Date and Time
TBA

Bring your lunch, chairs or mats and join us

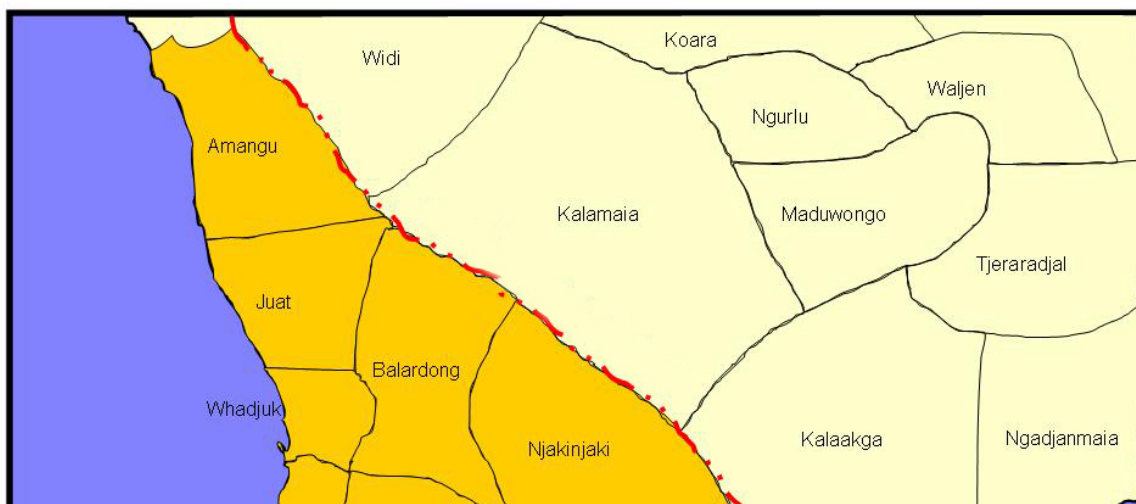


The project is supported by funding from the Western Australian Government's State Water Program & First Water Government Initiative

WICC natural resource management program

Government of Western Australia Department of Water and Environmental Regulation

ABORIGINAL GROUPS OF THE SOUTH WEST OF WESTERN AUSTRALIA





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Covid 19 Update

As of 20 March 2020 WICC has cancelled or postponed all non essential face to face meeting for 60 days. We remain contactable by email and phone and will continue with field work.

Please remember that even though many of you live in remote locations you are still susceptible to acquiring the virus.

Please practice good social distancing and hygiene measures at all times. We look forward to seeing you all on the other side of this lurgy.

Previous newsletters

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