

Catalyst Project FINAL Report

Grower Information

Grower Name:	Ray Zamora
Entity Name:	The Zamora Family Trust
Trial Farm No/Name:	F2137 & F8352
Mill Area:	Tully
Total Farm Area ha:	112.77
No. Years Farming:	15
Trial Subdistrict:	Riversdale (F8352 – 87.85 Ha) Murray (F2137 – 24.92 Ha)
Area under Cane ha:	112.77 Ha including fallow

Background Information

Aim: Improve Soil health by growing multiple species in the cane interspace

Background: (Rationale for why this might work)

The cane interspace becomes quite hard and compacted due to harvesting machinery. By growing multiple species in the sugarcane interspace, it has the potential to reduce the amount of herbicide required to grow the crop, improve water penetration and soil structure in the interspace due to the root structure of some of the species used and there may be some nitrogen benefit depending on the species.

Potential Water Quality Benefit:

Reduced herbicide usage and possibly the elimination of some pre-emergent herbicides, and reduced runoff.

Expected Outcome of Trial:

Hoping to be able to grow other species in the interspace and reduce the number of pre-emergent herbicide applications and possibly gain a small nitrogen benefit depending on the mixture species used.

Service provider contact:

Charissa Rixon – T.R.A.P. Services

Where did this idea come from:

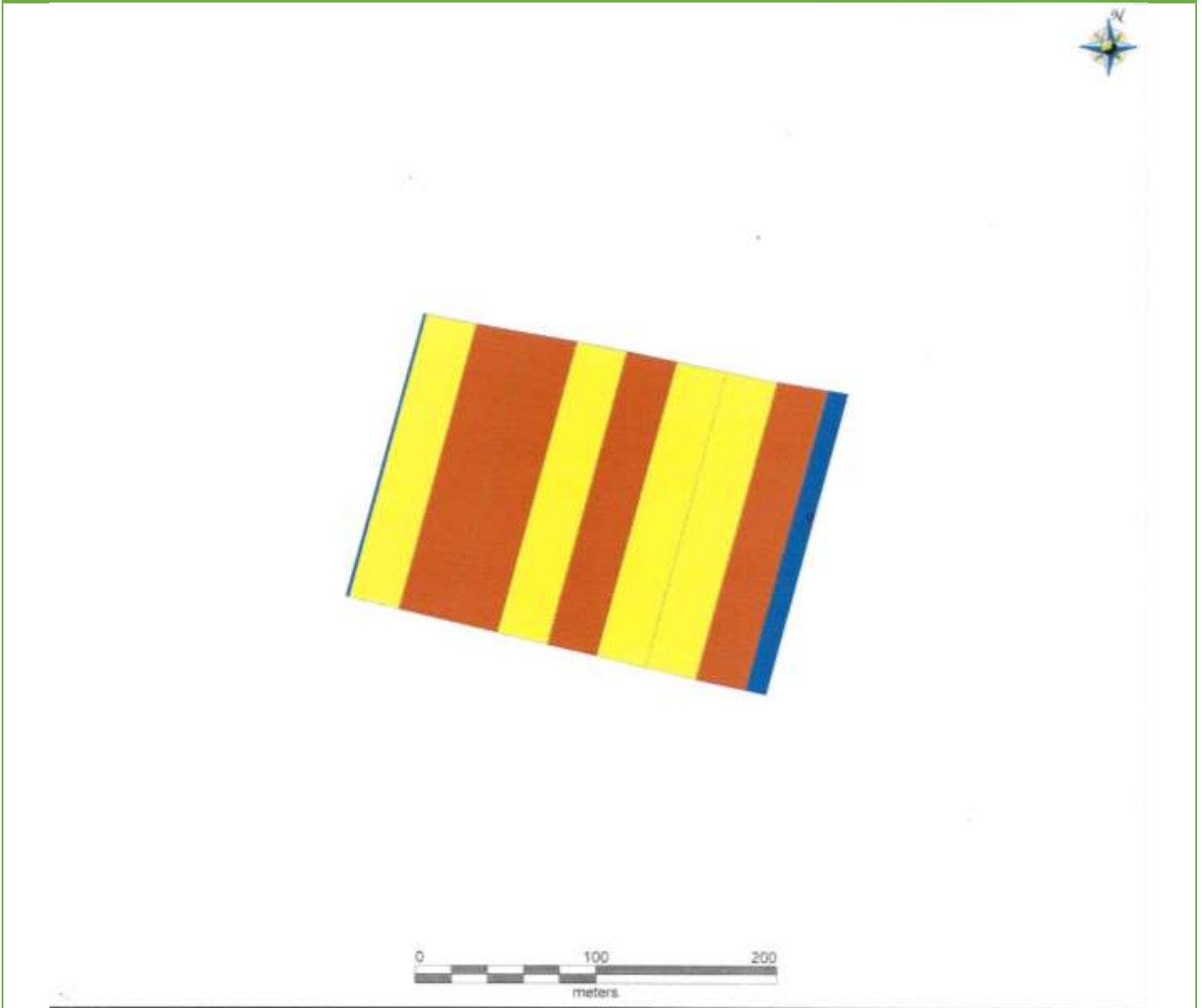
Soil health groups and other growers.

Plan - Project Activities	Date : (mth/year to be undertaken)	Activities :(breakdown of each activity for each stage)
Stage 1	July 2016	Plant Cane harvested Trial design decided.
Stage 2	Sept – Nov 2016	Layout trial Plant mixed species
Stage 3	July 2017	Harvest 1 st Ratoon Cane Post-emergent only herbicide spray if necessary
Stage 4	Sept 2017 – Jan 2018	Remark trial and replant trial Do biomass cuts Analyse biomass for N (Jan) Destroy grown mixed species crop (Jan/Feb)
Stage 5	July – Aug 2018	Harvest 2 nd Ratoon Cane Gather yield data and analyse Post-emergent only herbicide spray if necessary
Stage 6	Sept 2017 – Jan 2018	Remark trial and replant trial Do biomass cuts Analyse biomass for N (Jan) Destroy grown mixed species crop (Jan/Feb)
Stage 7	July – Aug 2018	Harvest 3 rd Ratoon Cane Gather yield data and analyse Post-emergent only herbicide spray if necessary

Project Trial site details

Trial Crop:	Sugarcane
Variety: Rat/Plt:	Q208 Plant 2016 Harvest 1 st Ratoon 2017 Harvest
Trial Block No/Name:	Blk 25B
Trial Block Size Ha:	4.14 Ha
Trial Block Position (GPS):	18.0123°S 145.8642°E
Soil Type:	Hewitt Soil series with Deep A Horizon

Block History, Trial Design:



Client: Ray Zamora
 Farm: F8532
 Paddock: 25B
 Name: F8352 Blk 25B Lat_Lon WGS84

Buffer
 Interrow Cropping - Mixed Species
 Standard Practice

2 x Treatments x 4 Replicates Q208 Planted 2015.

Treatments:

1. BAU
2. Cane Interspace planted with a mixture of 26.5% Sunflower, 36.7% Soyabeans, 14.8 % Sorghum, 11.0% Sun Hemp and 11.0% Gurr Beans (21 kg used to plant the whole trial – 10.5 kg/ha)

Results:

2016

In 2016, Ray applied a herbicide application of paraquat and imazapic after harvest, and then 10 – 12 weeks later planted with the mix, using a set of 2 gangs of 3 discs per interspace. This first attempt was unsuccessful, due to the very dry weather conditions that were experienced which hindered the establishment on the interrow crop, and it is possible that the imazapic may have also still been present due to the dry weather, and the long plantback periods it has on some species.

2017

In 2017, the crop was sprayed only with paraquat post harvest. Crop was harvested on the 8th July as 1st Ratoon. The same mixture and quantity was used again with a new planter setup. This time it was an airseeder with wavy discs. The seed was sown about the 25th September. Best results were achieved in the first replicate where Ray disced it 3 times whilst setting up the implement correctly. The predominant species in the interspace was the sunhemp. The photos below (taken 4th January) shows the large but shallow root system of the sunhemp (due to compaction) and the large nodules that were observed. 2 x 1m row cuts were conducted on the 4th January, showed that a biomass of between 3.8 to 11.5 t/ha was present. A subsample of this has been taken and mulched to allow analysis for nitrogen contribution of the above ground portion. The subsample was 76% moisture, therefore there was between 9 and 27 kg/ha of Total Nitrogen to be gained from the mixed species intercrop. Ray didn't yield the trial in 2017.

Dry matter Analysis

Grower Name :	Ray Zamora	Nearest Town:	EURAMO
Sample No:	021810865	Test Code:	PT3
Block Name:	F8352	Sample Type:	Tissue
Sample Name:	Mixed Species - Incrop	Sampling Date:	5/06/2018

Analyte / Assay	Units	Value
Total Nitrogen	%	1.00
Nitrate Nitrogen	mg/kg	<50
Ammonium Nitrogen	mg/kg	71.0
Phosphorus	%	0.09
Potassium	%	1.50
Sulphur	%	0.10
Calcium	%	0.33
Magnesium	%	0.24
Sodium	%	0.03
Chloride	%	0.57
Copper	mg/kg	8.0
Zinc	mg/kg	20.0
Manganese	mg/kg	71.0
Iron	mg/kg	38.0
Boron	mg/kg	15.0



Conclusions and comments

There is still a lot of learning to do. Not all of the species were successful at establishing in the cane interspace. More tillage is needed for establishment of many of the species used.

By the 4th January, vine had become an issue on one end of the paddock, necessitating a spray with a hormone type herbicide, which also killed the interrow crop. This is not detrimental as the interrow crop is meant to be destroyed, if it doesn't become smothered by the sugarcane.

Need some rainfall after seeding to improve crop establishment, and need to avoid the use of pre-emergent herbicides such as imazapic post harvest, if sowing an interrow crop.

Advantages of this Practice Change:

The major advantage to be gained from the interrow crop is diversity within the field to improve soil biology and soil health. The large tap root of the sunhemp, although it hasn't penetrated deep into the soil has started to break through the compaction zone.

The possible nitrogen contribution is yet to be analysed.

Disadvantages of this Practice Change:

Still to evaluate if there will be a negative effect on yield due to competition.

Will you be using this practice in the future:

Will continue to pursue this farming system, however there is still a lot to be learnt before this system can be used on a large scale.

% of farm you would be confident to use this practice :

Mixed Species interrow in crop is still very experimental and needs further refinement before being used across more of the farm.