Power point words to go with slides

Ecology in a changing climate

Biodynamic soil health and its potential role in future agricultural practices.

Good morning and welcome!

It's becoming clearer to view all biological systems as interrelated. Ocean, atmosphere, land and water.

The system under examination today is the sustainable use of our land ecosystem using Biodynamic Agriculture and its potential role in our changing climate.

What is Biodynamic Agriculture? Let's look at the words. Bio – life. Dynamic – force. The life forces of the soil are soil microbiology and soil balance. So….. Bd is a method of ORGANIC farming, which emphasises the balance and interrelationship of soil microbiology, plants and animals. This creates an holistic, self-nourishing system. **BD methods also take into account the atmosphere which no other form of agriculture addresses.**

Biodynamic methods seek to increase micro-organisms in the soil, improve water-retention & aeration of soils, inhibit plant disease, improve plant resistance to heat & drought stress and to increase yield, flavour & keeping qualities of vegetables, just to name a few.

The Biodynamic approach excludes the use of all artificial chemicals, pesticides, fungicides, artificial ferilizers on soils and plants.

Instead BD farmers look on so called weeds and insect pests as messengers.

Biodynamic Preparations are living substances made from a combination of animal, plant and mineral ingredients, which are used as field sprays and compost additives.

Biodynamic practitioners also use an Astronomical Calendar. This takes advantage of the moon phases…

The Biodynamic approach has many sceptics, as there is only anecdotal evidence that it reverses degradation of the landscape and promotes soil health.

With a grant from the South Coast NRM in the South West of Western Australia I worked with 8 farmers on a field trial. The farmers gave me between 10 and 20 H which was divided into adjacent control and trial sites. For the 12 month trial period only Biodynamic preparations were sprayed on the trial site. The control site was untouched.

How is soil health measured?

Biology balance of the soil is made up of diverse organisms ranging in size from the tiniest one celled bacteria, algae, fungi and protozoa, to the more complex nematodes and micro-arthropods, to the visible earthworms, insects, small vertebrates and plants.

Soil quality is also dependent on biology balance as well as structural and mineral components to create healthy plants and animals. When there is a balance of these components healthy soil becomes more friable, retains moisture and nutrients where they are of most use to plants, creates humus, increases photosynthesis and therefore carbon sequestration.

Do all these parameters promote ecological resilience in the environment?

Let's see what happens when we look at the statistical evidence of the data collected from the trial and control sites over a 12 month period.

The vertical axis shows the percent of biology and horizontal axis the time line. Both trial and control sites started at the same base point, prior to the application of any Biodynamic preparations.

It is obvious that mid season the biology of the trial site was increasing and by the end of the season there was a significant difference.

Looking at the control graph you can see there are seasonal fluctuations but insignificant changes in biology balance.

Instead, observing the biology balance of the trial site, the seasonal fluctuation shows a significant jump. In the south west of WA, summer is our dormant period. There is very little rain between November and May and temperatures get up to the high 30's and 40's. In June, after the first rains of the season, soil analysis showed a clear significant increase and the trend continued till September at the end of the 12 months seasonal time line.

Desirable parameters for soil quality, which also depends on biology, are the structural and nutritional mineral components. It was not expected to see the same significant differences as in the biology. The control site had no significant changes even after the hot dry summer period.

However, the trial site did show a steady increase in the soil balance parameters of pH, water and nutrient retention, soil friability, root mass and 25% more grass mass after a plate count was done on one farm.

So…. What does all this mean?

Scientific statistical evidence shows that by using the Biodynamic preparations on a regular basis over a 12 months season improvements in the health of the soil increases overall balance of soil biology, structure and mineral makeup.

Do Biodynamic Agricultural methods work?

It would seem that they do. From not only the statistical evidence, also observational evidence changes the soil effectively.

It is efficient – suggested spraying of BD preps is 4 times/year compared to conventional cropping practices of every month during the growing season.

And it is economic. A fraction of the cost of any other form of agricultural practices. All BD preparations can be made on farm.

Can this be maintained long term? Certainly the statistics show a significant improvement in the biological community within as short a time as 12 months. Could biology and soil balance mitigate changes in our fluctuating climate? Isn't this why we are here today? To discover new ways to evolve ecology with our changing climate.

The preps can also be used just as effectively in a garden as broad acre cropping. Next time you are in Perth come and taste my tomatoes.

I would like to acknowledge

South Coast Natural Resource Management Inc for funding this project.

To all eight farmers who gave up to 20 H of their land for the BD trial and to the 4 farmers who could see and feel the changes and made the decision to spray the BD preparations on the whole of their land.

To SWEP Analytical Laboratories in Melbourne for their patience with my never ending questions.

Peggy McDonald for giving unstinting time in putting the report together in a scientific manner.

And last but not least to my scientific colleague Dr Gagliano for this power point presentation and encouraging me to tell my story and be here today.

“On the control site, there is an average of 17.5 cm of grass, which equates to 2.95 tonnes of dry matter per hectare; on the trial site there is an average of 23 cm of grass, which equates to 3.72 tonnes of dry matter per hectare. Thats an **increase of 26%!!!!”**