ADAPTING FARMING PRACTICES TO CLIMATE CHANGE

- A Submission by Murray Irrigators Support Group, MISG.

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INTRODUCTION

This submission is made by Murray Irrigators Support Group, MISG, which was formed in 2008 to support farmers during climate change.

To take advantage of collectively pooling resources with Government bodies, Council, grant writers, and industry representatives for a more productive outcome for our farmers.

As part of the process for this submission, into adapting farming practices in a changing climate the MISG held a forum for farmers to participate in this submission.

Farmers voiced their innovative approaches to saving water and techniques they have implemented or believe should be implemented to improve productivity on their farms, using less water in this hotter drier climate.

Farmers are concerned about the future of their industry and this was their opportunity to participate and potentially enhance these innovative techniques to improve productivity through government funding.

We have uncovered eight potential ways of saving water that could be funded by a Government grant to our farmers of $10,000.00 each to implement one or more of these innovative techniques to improve on farm efficiency.

Farmers would do the research as part of their education.

Farmers would be asked to present their application as a business case to justify the expenditure incurred.

Farmers would be asked to document the water savings and submit these findings to the inquiry so further study may be done on water savings.

ISSUES

Traditional Surface Irrigation in some cases has proved to be inefficient it applies excessive water to the soil allowing water to soak into the water table and causes water logging of plants and soil.

The largest water user in the country is still Surface Irrigation approximately 70% of the nation's water used is for irrigation and of this 80% is Surface Irrigation.

There has been no major funding into research by any Government to make on–farm Surface Irrigation more efficient.

There is a percentage of soils that shouldn't be irrigated, soils that are too pours and should be planted to trees to enhance carbon sequestration.

The Farmer and Industry is developing innovative techniques to improve Surface Irrigation and make it highly efficient low energy irrigation by implementing new practices.

SOLUTIONS

1. Padman Stop and the Fast Watering Project

The Padman Stop, an invention by John Padman a 100% water tight control structure used in conjunction with the Fast Watering System also called low energy irrigation developed by John Padman.

Basically our trials of over 500 farms have shown that the faster the water is applied to the bay, the less water is used.

Further to this it has been demonstrated at the Padman Stops trial research site that it is possible to control water application fairly accurately on to the bay, and to achieve the highest efficiency possible, more research needs to be done on application rates and frequency of irrigation.

Higher flows can easily be achieved by using the channels as storage.

This form of Irrigation is carbon positive because it uses less energy and produces more crops, which in turn will increase carbon sequestration.

John Padman won the Regional and Rural Category of the National Save Water Awards for his Padman Stop and Fast Watering System.

2. Soil Moisture Monitoring Equipment

The Northern Victoria Irrigation Renewal Project (NVIRP) in conjunction with the Department of Primary Industries (DPI) is currently implementing a project to demonstrate the use of Soil Moisture Monitoring equipment for scheduling irrigators.

This becomes an essential tool in low energy fast watering irrigation.

Soil moisture monitoring equipment provides a tool that enables irrigators to make more informed decisions regarding the water requirements of various crops.

Demonstration sites have been established and SMM equipment will be installed across a range of crop types including permanent pasture, annual pasture, winter/summer cropping and Lucerne.

Soil moisture monitoring can assist with scheduling irrigation.

This can result in significant on-farm water efficiency gains and increased productivity.

3. Performance Evaluations for Irrigation Systems (Surface)

Investment in changing or improving irrigation delivery systems requires an understanding of the existing system application efficiency and the ability to improve this factor.

Evaluation of irrigation performance based on annual water use and production provides useful benchmarking data but does not provide an adequate diagnostic tool to identify current inefficiencies or the potential to improve.

The Irrimate™ system developed by the national centre for Engineering in Agriculture provide a real time assessment of the infiltration characteristic using a volume balance equation.
Once the infiltration parameters are known, different scenarios can be modeled.
Options include increased flow rate, reduced bay length and/or width or changed bay slope.
The modeling results can assist the landowner in future investment decisions:-

1. **Changing bay sizes**
2. **Increasing flow rates**
3. **Converting to pressurized irrigation where target application efficiencies cannot be met under any practical surface irrigation option.**

4. Automation

Automatic irrigation controllers open and close bay outlets and channel stops in Surface Irrigation giving precise control which will save water solving the dilemma of farmers, being out to all hours, in the day or night watering.

The units will operate the stops either at a predetermined time or at a predetermined distance along the bay.

The controller will do for Surface Irrigation what the garden control will do for the home garden.

It is essential for fast watering because of the precise control needed.

5. Field Application Efficiency and Distribution Efficiency

Landowners are often concerned that losses in their open channel systems form a significant part of the overall farm irrigation efficiency.
As a result major investments have been made in converting to pipelines or lining of channels.
It would be prudent however to first measure both the field application efficiency and distribution efficiency prior to making such investment decisions.
Distribution efficiency is the ratio of water delivered to the field compared to water delivered to the farm gate. If field applications efficiencies are very low, it may turn out that distribution efficiencies are actually quite high (even if channels leak.)
This can lead to an inappropriate investment in fixing part of the system which in fact will have little effect on the overall farm efficiency.

A farm audit should be conducted to assist the landowner in making informed decisions. A farm audit will measure:-

1. Distribution efficiencies
2. Application efficiencies (using Irrimate™)
3. Distribution uniformities (using Irrimate™)

And report on measures that can be taken to improve any of these measures.
Distribution uniformities require measurement of channel losses breaking them down into these main components:-

1. Seepage
2. Evaporation
3. Leakage

Once the landowner understands the percentage of total loss contributed by these three components he can then properly assess remedial action.

6. Crop Diversity

Farmers are going away from summer pastures which require more watering and diversifying into other crops which need less water such as annual rye grasses and clover combinations as their autumn crops and summer crops such as maize and sorghum which require less watering.

The amount of produce grown varies enormously with different species of crops particularly perennials, summer grown crops compared to annual autumn grown crops.

Farmers are choosing not to water unviable land and will be advised to plant it to trees to assist in the carbon sequestration for carbon credits.

Conclusion

With the changes caused by climate change, the lack of runoff water in our dams has been the major factor for farmers with reduced irrigation allocations.

Surface Irrigation practices have been evolving in the 70s and 80s with the event of laser grading, these were the wettest decades on the century and even then rising water tables were a major concern only to be stopped in the late 90's when our rainfall started to decrease.

There has been no major research conducted by any government since that time, considering Surface Irrigation is still the largest water user in the nation.

We need the Government to invest in research in the area of Surface irrigation.

We propose in this submission that the Standing Committee that

A grant of $10,000.00 per farmer per year for:-

1. Installing 100% watertight Stops
2. Trialing Low Energy Irrigation such as Fast Watering
3. Trialing Moisture Monitoring Equipment
4. Trialing Performance Evaluations for Irrigation systems (Surface)
5. Installing Automatic Irrigation Controllers
6. Trial field application efficiency and distribution efficiency methods
7. Trial crop diversification
8. Research and education for farmers