AMURI IRRIGATION CO
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ENVIRONMENTAL COLLECTIVE NEWSLETTER

Managers course

COVID-19 RESPONSE

We hope this newsletter finds you and your families well and managing to find ways to continue the essential work of farming in ways that minimises social contact and keeps your staff and the community safe.

AIC's priority is to keep everyone safe and well. To do that we have had to modify how we do our jobs to meet the requirements of the Level 4 response and stay safe. Our office is closed but is being used on a very limited basis by our operations staff. Other staff are working from home and we are fortunate that our capacity for remote working is good and staff can access various sources of data from cloud-based systems. Both Alastair and Renee are working normally and are available by phone or email.

However, we have had to make some changes to our planned environmental related work, in particular:

- **Postponing Irrigation Operators Course:** We have postponed the second of the two irrigation courses we were running this year, which is a pity as we had great attendance at the earlier Managers Course and received very positive feedback from participants. This course is suitable for any staff who may move or operate irrigators on your farms. We will be running this once the circumstances permit.
- **FEP Auditing:** We have concluded our 2019/20 round of FEP Audits with seven farms left to be audited. We have a three-month extension from ECan to complete these and are not at risk of breaching AIC's land use consent or putting any individual consents at risk. ECan will review this and give us a further extension if needed. We are currently analysing results from the completed 66 audits and will be reporting on this in our next newsletter.

AUDITING FARMS WITH LOW ENVIRONMENTAL RISKS

Together with other Canterbury irrigation scheme Environmental Managers and independent FEP Auditors we have been in discussions with ECan regarding auditing and grading of what are termed 'low risk farms' (LRF). Low risk means that the farm presents very low environmental risks even though they may not be at Good Management Practice (GMP) for some areas of their operation. For example, a low intensity sheep enterprise that has a small area of older irrigation that probably can't meet all the irrigation GMP targets.

In these situations, requiring the farm to meet GMP would not lead to any significant reduction in environmental risk but would impose significant personal stress or financial hardship on the farmer. We clearly want to avoid these situations, but at the same time need to remain fair and consistent for the great majority of farms who are working hard to get to and achieve GMP.

We are close to a workable solution that will hopefully be in place for the next round of auditing that will give auditors some flexibility to grade these farms sensibly whilst retaining sufficient checks to clearly demonstrate the farm is 'low risk' and the system is not abused.

IRRIGATION EFFICIENCY BENCHMARKING

We have been developing a model to benchmark the irrigation efficiency of the AIC shareholding farms to get a measure of how efficient the scheme is as a whole and give an indication of the irrigation efficiency of individual farms.

If we can produce robust evidence on how efficient both the scheme and our farmers are using water, that puts us in a strong position to show both regulators and the community that we take our environmental responsibilities seriously. It also gives AIC a tool to identify farms and work with those who may not be meeting the 80% efficiency target to improve performance.

The model has been developed by collecting and analysing a range of available data. This includes:

- Accurate daily water use data from the Rubicon system;
- GIS data on the type and area of irrigation systems on shareholding farms;
- Detailed climate maps for the Amuri Basin using both WaterForce and NIWA weather stations which provide accurate daily local rainfall and evapotranspiration; and
- Information on soil Plant Available Water (PAW).

Our model can estimate the seasonal soil moisture deficit per farm and the depth of applied irrigation. As with any model some assumptions are made. We have included data for the 2018/19 and 2019/20 seasons and believe it is reasonably accurate.

Irrigation efficiency	% of Total (by area)
<70%	5%
70-80%	9%
80-85%	7%
85-90%	7%
90%+	54%
95%+	18%
TOTAL	**100%**

The results indicate that the scheme as a whole is more than meeting the 80% efficiency target and that the great majority of farms are achieving or exceeding the target. We have also identified some farms that may not be using water as efficiently as they need to. AIC will not be using the results to penalise farmers but rather to educate and assist farmers in evaluating their system. We have included this information in a couple of FEP audits and found farmers have been keen to discuss where they could improve efficiency, which is encouraging.

We are now looking at developing a farmer dashboard to allow farmers to access their own irrigation efficiency information so they can benchmark their farm.

NITROGEN EFFICIENCY BENCHMARKING

Another efficiency tool we have been working on is Nitrogen Efficiency Benchmarking. This uses information from nutrient budgets and collectively analyses it using newly released tools in OverseerFM to estimate how efficient farms are being in their use of nitrogen.

The indicator we will be using is the Nitrogen Surplus figure which OverseerFM generates for every separate block modelled and the farm overall.

So, what is Nitrogen Surplus?

Nitrogen surplus is a simple measure of the nitrogen from all sources which move into the farming system (fertiliser, applied effluent and imported feed) minus the total nitrogen that is removed from the farming system as exported products (stock, wool, milk crops, etc). What remains is the surplus nitrogen that is left behind in the soil.

Surplus nitrogen has been lost to the farm's productive systems and can either be:

- locked up in soil organic matter made largely immobile and unavailable to the plant;
- volatilised or lost to the air as ammonia and nitrous oxides; or
- leached out of the soil and into groundwater as soluble nitrates.

Nitrogen surplus is an indicator of how efficiently the farming system is using nitrogen. A high N surplus number (given in kg/N/ha/yr) indicates low efficiency and a low number indicates high efficiency.

The next stage of the project would be to make this information available on a farmer dashboard to allow you to benchmark your business farm against the average. The intention being to allow you to evaluate your own systems and see where improvements can be made for the benefit of not only your own business but the environment.

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