

# I. & R. LOBBAN SERVICES Pty. Ltd.

A.C.N. 007 884 086

FRUIT PROCESSING & WATER TREATMENT CONSULTANTS

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13 Koonunga Avenue,  
Rostrevor 5073

Phone and Fax:  
(08) 8 336 5969

12.5.98

Mr. Stephen Rice  
Managing Director  
Turbu-Flow  
8 Bedford St  
Nedlands

Dear Stephen,

Please find enclosed the report on the operation of the two Turbu-Flow units that have been in use for the longest period.

I am still awaiting the test results of the water from the area so a profile can be drawn and problem areas targetted.

I trust this helps your cause a little.

Yours faithfully



Ian Lobban

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OBSERVATIONS ON THE EFFECT TURBU FLOW ANTI SCALE SYSTEMS  
HAVE HAD ON IRRIGATION SYSTEMS IN SOUTH AUSTRALIA.

## OVERVIEW

The McLaren Vale or Southern Vales grape growing area in South Australia has long been recognised as an area for the production of premium wines.

The area relies mainly on rainfall and the storage of excess rainfall for its irrigation source. However many growers do not have sufficient storage facilities to ensure adequate supplies through the irrigation season viz October to February.

The increase in new plantings has also overextended the storage capacity of most vineyards with a result that extra water for irrigation has been obtained from bores.

These bores tap into an underground reservoir known in South Aust as the Willunga basin. This basin extends south to Victor Harbor and as far north as the Barossa Valley and incorporates the Adelaide hills grape growing areas. The water from this basin has a very variable iron and salt content. Variations from 2mg/lt to 15mg/lt have been detected within a kilometre of bores. The most severe problems are appearing in the McLaren Vale area where levels of iron are consistently above 5mg/lt. As a complete study on the area has not been as yet completed a detailed map of the problem areas is not available.

In an attempt to overcome the iron problem many different methods of pre-treating the water have been tried.

These include

1. A spray filter whereby a spinning disc is used in an attempt to collect the iron. These units work but require constant cleaning
2. Sand bed filters have also been used with very little result.
3. The aeration of water in an elevated storage tank where settling can occur before the water is pumped to the system. This method has worked on small holdings but is very expensive to both set up and maintain.

The only method which has had any degree of success is to maintain a supply of extra drippers so they can be exchanged during

OVERVIEW (cont)

an irrigation. The blocked drippers are then soaked in hydrochloric acid before being manually cleaned. This has proved to be a very costly and labour intensive exercise.

In conjunction with acid cleaning of drippers the injection of chlorine into the system has been tried to remove the iron deposits within the mains. This has proved to be marginally effective in the short term, but deposits are still occurring despite all the efforts taken to remove them.

During the last eighteen months several Turbu-Flow units have been installed in an attempt to overcome the iron problem. The results of the Turbu-Flow installation on two properties follows. These units have been in operation for the longest time and reflect how they have performed.

INSTALLATION No 1

D & K MacMillan  
RSD 663 Blewitt Springs Road  
McLaren Vale 5171  
Phone 8383 0226 Area code 08

This property is situated in an area of McLaren Vale with a known iron problem in the irrigation water. The amount of iron in the water is not known as tests have not been carried out. Given the results of test carried out in the region it is expected that the iron content would be between 5 to 10 parts per Million. The property comprises approx 20 acres of vines aged between 15 to 20 years with an even balance of red and white varieties. The property is irrigated from a bore fitted with a submersible pump using 50mm PVC mains breaking down to 20mm sub-mains to which the drippers are attached. The drippers are a combination of designs but predominately of the turbo key type.

It must be pointed out that various types of drippers have been used over the years in an effort to resolve the iron problem and some old design drippers are still in operation on this property. While this is not totally satisfactory it is common practice whenever growers try to overcome irrigation problems. The iron problem has been with this property from the start of irrigation and has become progressively more acute as the scale has accumulated in the mains.

The measures taken to try and curb the iron problem include

1. Constant flushing of all mains and sub-mains.
2. The injection of acid followed by chlorine into the mains in an attempt to break the scale up.

In spite of these measures the drippers continued to block and to remain blocked with a hard crystalline iron deposit.

The only measure that achieved any result was to remove the dripper completely and replace it with a cleaned unit. The blocked unit would then be acid washed to be used again. This practice had to be done at least 3 times every season.

These procedures while essential in maintaining an adequate irrigation regime were very time consuming labour intensive and costly

D. & K. MACMILLAN (Cont)

In December 1996 a model 50220 Turbu-Flow unit was installed.

No extra cleaning was done to the lines prior to the use of the unit. The usual procedures were carried out during subsequent irrigations viz changing of blocked drippers and flushing of mains and sub-mains.

After a period of a month it was noticed that the number of blocked drippers were declining and the amount of waste being discharged from the sub-mains was increasing. It was also noticed that the blocked drippers once removed were easily cleaned without the use of acid.

At the end of the season in March it was evident that a change had occurred through the system. A marked decrease in blocked drippers was evident coupled with an increase in actual output from the pump. This increase in water supply was attributed to the fact that the drippers were operating at their correct output levels.

During the 1997-98 irrigation season further improvements to the system was noticed with the level of maintenance now cut by 75%. This has resulted in significant savings for the grower. The flushing of mains and sub-mains continues with the accumulated scale gradually being removed.

The grower is planning to heavily chemically clean the mains this year in an attempt to remove all remaining scale in an endeavour to further minimise blocking.

The grower has expressed his satisfaction with the unit and is optimistic that further improvement will be made once the residual scale has been removed.

INSTALLATION No2.

R & D VOS

Blewitt Springs Road

McLaren Vale 5171

Phone (08) 83830041

This property is situated in the same area as the MacMillan property and has similar problems. Again no precise figures are available as to the iron level but it is expected to be between 5 to 10 parts per million.

This property comprises approx 30 acres of vines of which 20 acres are new plantings. The remaining 10 acres are of mature vines approx 10 years old.

With the exception of the mains servicing the older section all the mains and sub-mains are new.

The water is pumped from a bore using a submersible pump with 50mm mains and 20mm sub-mains for drippers. The drippers are of the turbo key design.

A Turbu-Flow model 50220 was installed at the property in October 1997. It was noticed at the time of installation that although only three to four irrigations had been done a layer of iron scale had formed on the inside of the borehead pipe. This unit has completed one season with satisfactory results. The new area of irrigation has not incurred many blockages and those that did occur were easily cleared in place.

It was noticed that when the blockages did occur the dripper slowed its output gradually and did not stop as a result of a buildup of cystalline iron rather a build up of an iron sludge which was easily removed.

The older section of vines also showed a decrease in dripper blockage in line with the results achieved at the MacMillan property.

The owners have voiced their satisfaction at the performance of the unit.

## CONCLUSION

I feel that the results achieved by the two unit discussed has been very satisfactory.

The unit installed on the MacMillan property has shown the best results given the difficult conditions faced.

The years of accumulated scale has made trouble free irrigating difficult to achieve as the Turbu-Flow unit is causing flakes to come free from the main pipe walls. In an effort to overcome this problem they are to undertake a rigorous cleaning program prior to the next irrigation season. This I feel will improve their system even further.

The Vos property has had different problems inasmuch as the drippers of the new section were filling with a sludge before stopping.

I feel that this problem is being caused by the owners trying to irrigate too much at a time thereby restricting the flow and pressure to the drippers. This has been discussed with them and further work will take place in the new season.

Other Turbu-Flow units have been installed in the area but as they have not been in operation for any length of time no worthwhile conclusions can be drawn.

Given these encouraging results and the ongoing iron problem in the area I feel more units will be installed prior to the next irrigation season.

To demonstrate how the units work I have conducted a simple experiment. At a clients property I have connected a unit to an outlet of their system and adjusted the flow rate to suit. I then take two 5litre samples of water in clear jars.

One diect from the borehead the other from the unit.

A small quantity of alum is mixed to aid sedimentation and both samples are left to stand.

I have noticed that after 24 hours the untreated water has particles of iron- some as big as match heads-which are very hard and crystalline.

The treated water has a very fine sediment - much like red dust on the bottom which when you carefully decant some out is very "slippery". when you put it on your fingers.

This may help sway some waverers.

I shall keep in touch with developments

Best regards

A handwritten signature in cursive script, appearing to read 'Ian Lobban', written in dark ink.

Ian Lobban