

NEWSLETTER

AUSTRALIAN SEAFOOD INDUSTRIES

AUTUMN 2018



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ASI has been indentifying opportunities which could provide value to stakeholders and to secure future revenue.

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Important results from the ten POMS experimental trials over summer 2017/2018. It includes a total of 124,402 animals from both the YC16 and YC17 year classes.



STRATEGIC DIRECTION FOR ASI

In early February, before the detection of POMS at Port Adelaide, the ASI Board met to discuss strategic directions. The aim was to identify things that ASI could do to provide value to stakeholders and to secure future revenue.

Most of the ideas put forward centered on building alliances with R&D institutions. These alliances, such as the CRC-P program, provide much needed cash and also encourage researchers to develop ideas that help ASI to improve services to the industry.

Areas suited to alliances include molecular genetics and gene markers, advances in tetraploid technology, and selling services to the Pacific Oyster industry in the USA. To follow up on the last point, Matt Cunningham took a lightning trip to the Pacific Northwest Oyster conference in Seattle and you can read his report later in the newsletter.

Also, we have always been interested in benchmarking the performance of ASI oysters under commercial conditions and one emerging idea is that ASI might be able to gain access to “public” water to grow a range of oysters that can be used to conduct scientific and educational activities. The specifics of running scientifically sound benchmarking are turning out to be quite difficult, but we will continue to investigate options.

The recent discovery of POMS in the Port River is a blow we did not need at all. My admiration and thanks go to the people in PIRSA, SAOGA and throughout the industry who implemented the emergency response. It is also heart-warming to see the public response and we can only hope the infection is now contained. I would also like to thank Trudy McGowan, Gary Zippel and Matt for their initiative that resulted in ASI oyster families being placed in the Port River to test their resistance to POMS. This will produce invaluable local information.

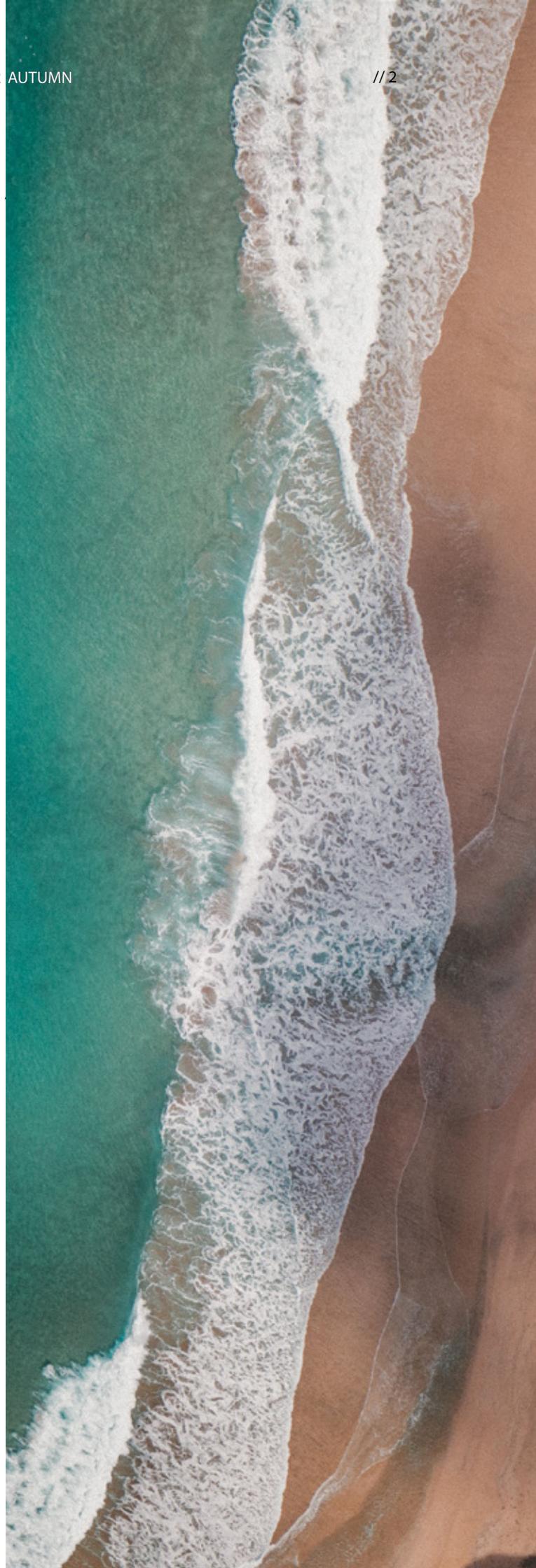
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Of course, this places even greater emphasis on breeding POMS resistant, ASI broodstock in South Australia. The South Australian component of the ASI breeding program has been done at SARDI over the past 2 years as part of the Future Oysters CRC-P project. Over that period 90 families have been produced. A call for expressions of interest from organisations interested in continuing this work was released in March and a decision is imminent.

One of the ASI directors, Professor Graham Mair has been appointed to a very prestigious position with the United Nations Food and Agriculture Organisation in Rome. In that role he will have a global overview of aquaculture and genetics. We are very sorry to lose Graham, but we also wish him well in his new role. A call has gone out for expressions of interest from people interested in replacing Graham on the ASI Board, with responses due to be the end of April.

And finally, a note on the levy. My thanks go to the hatcheries who are efficiently passing on growers' levy payments to us. Please keep it up. The budget is very tight this year and we will need every dollar we can earn.

Dr Len Stephens
Chairman.



// GLOSSARY OF TERMS //

The aim of the ASI newsletters is to keep industry updated on the progress of the breeding program. We often talk about our work in a language that we use every day and makes sense to us, but we appreciate this may not be the case for all. To make it easier for everyone, we've put together a glossary of some of the terms we commonly use to describe our work.



Estimated Breeding Value (EBV)	A measure of performance for a particular trait that is calculated based on collected data and pedigree. EBV's are an estimation of results based on the data we have collected during our various performance trials. Actual performance may vary for a number of reasons including POMS outbreaks which are more or less severe than we have previously experienced.
Exposed Oyster	An oyster which has been exposed to a POMS outbreak and survived.
Naïve Oyster	An oyster which has not been exposed to POMS.
Selected Oyster	An oyster which has been selectively bred for POMS resistance.
Unselected Oyster	An oyster which has not been selectively bred for POMS resistance.
Breeding Population	A closed population which does not receive new outside genetics and receives continual influence of selective breeding. Highest performing animals are retained as parents for next generation.
Year Class: YC16, YC17	A set of families spawned at the same time in the same year. For example, YC16 = oysters bred in 2016.
Family	A family of oyster is made by crossing two individual oysters from known families.
Between Family Selection	Selecting the best families based on their performance data.
Within Family Selection	Selecting the best individuals within a family eg Breeding from POMS survivors.

AS ALWAYS, IF YOU WOULD LIKE MORE INFORMATION ON ANY OF THE CONTENT WITHIN OUR NEWSLETTERS, UPDATES OR ON THE WEBSITE, PLEASE FEEL FREE TO CONTACT MATT:

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GENERAL MANAGER'S REPORT

The arrival of POMS in the Port River in South Australia was certainly a development that nobody wanted to see this POMS season. This has heightened the sense of urgency in making ASI families available to South Australian hatcheries to help mitigate against the risk that POMS will spread to Oyster growing regions in the near future. I am pleased to report that we have, in conjunction with PIRSA and SARDI, been able to get the YC16 families produced in SA into the Port River for a short-term POMS exposure trial.

These families are now over 1 year old and should be suitable for use as commercial Broodstock in the short to medium term. We have results from POMS laboratory trials but field trials are always the acid test for POMS resistance. Mortalities have been observed in this trial and data will be collected in the coming weeks.

This data will strongly guide the decisions we make in terms of which families we recommend for commercial production. As soon as we have analysed the data we will be supplying hatcheries with these families. Big thanks again to all that helped in getting this trial established but in particular to Gary Zippel and Marty Deveney who gave up their Easter Saturday to

put the Oysters in the water.

The POMS season in Tasmania has on the whole not been as severe as previous seasons. The exception of course is the November outbreak in upper Pittwater which saw a severe disease outbreak causing significant mortalities. The mortality rates in both commercially produced stock and the ASI families was higher than expected. The simple reason for this in our opinion is that it was a more severe outbreak than in previous seasons.

The causes for this are not completely clear but are likely to be a result very high-water temperatures and significant biomass of unselected or low resistance stock. In other growing regions the outcomes have been much better for growers using commercially produced ASI lines. These regions may not have seen the severe environmental conditions but the ever-increasing resistance of the farmed stock continues to reduce the risk of POMS decimating stock.

Significant mortalities have been reported in triploids and unselected stocks. ASI makes predictions about POMS resistance by calculating Estimated Breeding Values (EBV's) for all of our families.

// GENERAL MANAGER'S REPORT //

It is important to understand that these EBV's are an estimation of results based on the data we have collected during our various performance trials. Actual performance may vary for a number of reasons including POMS outbreaks which are more or less severe than we have previously experienced.

The family breeding season has been successful in Tasmania and South Australia with target numbers of families produced. It wasn't all plain sailing, particularly in Tasmania, where we had a major batch failure most likely due to sourcing Broodstock from Little Swanport which once again was heavily affected by toxic algae blooms.

The Broodstock were collected after the bloom had dissipated but it appears that even low levels of toxins can have major effects on early development of larvae. We were able to redo the run but it cost us 2 weeks which proved to be significant in terms of deployment for spat trials.

Family production really is the base on which the selective breeding program is built, without the families you don't have anything. So, it was a great result this year and we look forward to seeing how these families perform in the field. Once again, a big thank you to Greg and the team at IMAS and Xiaoxu and his team at SARDI.

Spat trials have been a major focus for the team this year and generally these have been quite successful. The trials had variable success but we were able to get good data on all the YC17 families. Survival rates were obviously much lower than with 1-year old animals but I am very optimistic that we will be able to achieve good gains in spat resistance in the way that we have with 1-year old. In addition to the data we now have a source of breeding stock which have survived POMS as 2-3mm spat. Whilst pedigree is king in terms

of selective breeding, the ability to breed from animals that have been exposed as small spat is the icing on the cake. There should also be sufficient numbers of spat available to be able to supply moderate amounts to commercial hatcheries. The first cab off the rank in terms of broodstock supply in Tasmania will be the YC16 families and we will be making Oysters available that survived the Pittwater "super hit". These will be distributed in the coming weeks.

Matt Cunningham
General Manager.





US TRIP REPORT

By Matt Cunningham

I recently visited Seattle to attend the National Shellfisheries Association meetings and conference. There was a full day dedicated to OsHV-1 research which was the major reason for the trip. Another aim was to network with researchers and industry members to investigate possible collaborations. As mentioned in Len's update ASI is scoping options to broaden our sources of income and collaborating with international industries was seen as something worth exploring. The US industry is very concerned about POMS so it was seen as a good place to start.

Peter Kube from CSIRO and Peter Kirkland from EMAI presented on their respective research in breeding a POMS resistant oyster as well as researchers from France, Italy and the UK. Whilst the work done by international stakeholders was good research and very interesting, what stood out for me is how

commercially focused our research has been in Australia and how the outcomes have flowed directly to industry. To be honest if I never have to sit through another high-end genomics presentation and be left thinking "so how does that help", I won't be too upset.

I was also able to start dialogue with industry about potential collaborations. The large US producers have the capacity to pursue their own strategies for POMS and don't seem too interested in working with ASI. However, there may be the potential to work with a group of smaller companies who don't have the critical mass to work independently. The discussions were very embryonic but there is certainly interest. For ASI to commit to any collaborative arrangement there would need to be significant upside for us and we would certainly consult closely with our shareholders Oysters Tasmania and SAORC/SAOGA.

FIELD WORK UPDATE

By Lewa Pertl

Over the summer of 2017/18, we created ten experimental trials to collect high quality POMS mortality data for YC16 adults and YC17 spat. So far, it has been the biggest year for POMS trial, with a total of 124,402 animals being counted for survival data. Thank you to Mike Dove, Justin Goc and Micheal Riley (AKA: Chumpy) et al. for their generous contribution of resources for this work. Out of the 10 trials deployed, 8 had POMS hits in Georges River (NSW), Pittwater (TAS) and Pipeclay (TAS). Table 1 below summarises the field data for all these trials:



Table 1, summary of ASI's POMS field trial for 2017/18 summer POMS season over four sites. This table includes the summary data that has been collected, including their ages, family lines used, number of oysters counted and their corresponding POMS survival data. We now have spat and adult survival data for YC16 and spat data for YC17.

YC	SITE	AGE (MONTHS)	FAMILIES	NO. FAMILIES	NO. OYSTERS	AV_SURVIVAL
YC16	GEORGES RIVER	12	1-77	32	4,427	36%
YC16	PITTWATER	12	1-85	73	10,703	27%
YC16	PITTWATER	12	1-85	73	11,485	95%
YC16	PIPECLAY	12	1-85	73	11,374	78%
					25,877	15%
YC17	PITTWATER	2	1-40	36		
YC17	PIPECLAY	2	1-40	36	21,807	11%
YC17	PIPECLAY	3	1-40	36	18,471	3%
YC17	PIPECLAY	2	41-89	40	20,258	23%

// FIELD WORK UPDATE //

YC16 TRIALS

Two 12-month-old YC16 trials were deployed at similar times, in mid-late November at Pittwater and Pipeclay. Both trials had naïve stock sourced from Pipeclay, which were grown in their respective sites. The trial design consisted of bags attached to trays (see Image 1).

Pittwater had a significantly lower survivorship (27%) as compared Pipeclay (78%). The heritability for the Pittwater trial was 0.1, meaning that it was likely there was non-POMS related effects on stock mortality. During the trial experiments in November, both sites had witnessed unusually high temperatures with highest mean daily air temperature being 33.3°C (ref: bom.gov.au) and water temperatures ranging 22-30°C. In Pittwater, there was a larger presence of unselected or low resistance stock. Whilst the age was the same as for previous trials, the Pittwater animals were also significantly smaller (~20mm) than in previous trials (~60mm), which may have had an effect.



Image 1: The stock was naïve and sourced from Pipeclay. We laid out 76 families in number order in three reps. The reps were randomised according to the experimental design. 7 bags were attached to flat trays and were put out on the same day on 16/11/17.

YC17 TRIALS

Five YC17 spat trials from 13/12/2017 – 07/02/2018 were set up. Three of which were in Pipeclay and the remaining two in Pittwater. All spat were derived from IMAS. The results were as expected; with a bigger hit being seen in stock size less than 5mm. A substantial hit was seen in the second of the two trials in Pittwater (3% survival). In this experiment, different gear was used for holding the stock. Typically they are placed in mesh bags/socks and attached to trays (similar to Image 1), however this time oyster filled bags were housed in oyster trays (3 per segment). This may have caused extra stress on the animals due to lack of water flow and food availability.

This tells us that our original trial design is working well and creates minimal stress for the animals. Our objective for next breeding round is continue focusing on increasing spat resistance for next POMS season using our original methods.



Image 2: Counting the alive and dead YC17 oysters at Pittwater.

// ASI CASUAL STAFF

Many of the key ASI activities such as breeding and POMS trials occur over the summer months. As a result, we rely on casual staff to help us get through the sheer volume of work over this period. This year we have had a great group of casuals who strongly contributed to the team. We would like to acknowledge Khatarina Alter, Ethan Bowditch, John Wright, Oliver Sargent and Jeff Endo for the contributions they have made over the summer period and wish them well for the future.



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