Survey of growers on the effects of POMS on Pacific oyster farming in Tasmania

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Objectives of the survey:

1. increase our knowledge of POMS virus and oyster mortalities from observations and records generated by farmers
2. Provide this information to industry, looking for trends across farmers/growing areas, to inform farm management practices.
POMS survey:

- Most oyster farmers in POMS infected areas participated in a face to face interview.
- 37 questions in five sections: Background, POMS mortality, environment, genetics, and husbandry information, with a final question on research needs.
- Approved by the Human Ethics committee at UTAS
- Participation in the survey was voluntary and not all questions were answered by all farmers.
- Information provided is kept confidential. Results are provided as an average for 5 or more farms.
What average mortality have you experienced over summer before POMS and after POMS in Tasmania?
Have you experienced several POMS events this summer?

- More than one event: 21%
- One event: 18%
- Not sure: 61%

<table>
<thead>
<tr>
<th></th>
<th>Pipeclay</th>
<th>Pittwater</th>
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</thead>
<tbody>
<tr>
<td>&gt;1 event</td>
<td>40%</td>
<td>86%</td>
</tr>
<tr>
<td>1 event</td>
<td>40%</td>
<td>14%</td>
</tr>
<tr>
<td>unsure</td>
<td>20%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Most farmers with >1 outbreak experienced highest mortalities in 1st outbreak.
Which environmental factors do you think are most important in relation to mortalities on your lease?

- Proximity to other leases
- Biodiversity
- Rain and salinity changes
- Dissolved oxygen
- Wind and sediment
- Hydrology and water movement
- Water temperature

Rank (7 = most important)
What temperature regimes do you consider are required for POMS outbreak?

<table>
<thead>
<tr>
<th>Temperature °C</th>
<th>% of survey participants</th>
<th>Time period (days)</th>
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<tbody>
<tr>
<td>16</td>
<td>5</td>
<td>14 d</td>
</tr>
<tr>
<td>17</td>
<td>5</td>
<td>14 d</td>
</tr>
<tr>
<td>18</td>
<td>48</td>
<td>1-21 d</td>
</tr>
<tr>
<td>19</td>
<td>11</td>
<td>4.5 - 5 d</td>
</tr>
<tr>
<td>20</td>
<td>21</td>
<td>4.5 - 7 d</td>
</tr>
<tr>
<td>21</td>
<td>5</td>
<td>3 d</td>
</tr>
<tr>
<td>23</td>
<td>5</td>
<td>16 d</td>
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</tbody>
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Comments: minimum temperature is important (>18 °C)
Steady increase in temp for 1st outbreak, 2nd outbreak spikes variable and average temp higher.

Do you think temperature spikes or troughs are a contributing factor in triggering POMS outbreaks?

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<tbody>
<tr>
<td>yes</td>
<td>73%</td>
</tr>
<tr>
<td>no</td>
<td>15%</td>
</tr>
<tr>
<td>unsure</td>
<td>12%</td>
</tr>
</tbody>
</table>

- Spikes are more important than troughs (7 farmers), especially at low tide.
- Providing environment for rapid release of virus.
- Troughs slow down POMS infection
Did POMS affect some parts of your lease more than others?

- Yes: 9%
- No: 48%
- Not sure: 43%

Did you observe any evidence for water movements being involved in the transfer or severity of POMS?

Several farmers: “High flows = high mortalities”
Did the oysters on your lease spawn this summer?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Full spawn</td>
<td>30</td>
</tr>
<tr>
<td>Partial spawn</td>
<td>35</td>
</tr>
<tr>
<td>No spawn</td>
<td>25</td>
</tr>
<tr>
<td>Unsure</td>
<td>10</td>
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</tbody>
</table>

A few farmers noted a connection between spawning and mortalities.
What mortalities have you experienced on your lease in relation to selective breeding?

Results only provided where responses from > 5 growers.

<table>
<thead>
<tr>
<th></th>
<th>Spat</th>
<th>Juvenile</th>
<th>Market</th>
</tr>
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<tbody>
<tr>
<td>Naïve unchallenged</td>
<td>75%</td>
<td></td>
<td>12%</td>
</tr>
<tr>
<td>Naïve Pre-exposed</td>
<td></td>
<td>29%</td>
<td>10%</td>
</tr>
<tr>
<td>EBV 40% unchallenged</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EBV 40% pre-exposed</td>
<td>34%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>EBV 80%</td>
<td></td>
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</tbody>
</table>

Triploids 83%
Diploids 47%
Which of these husbandry factors do you think are most important for mortalities?

- Tubes versus trays
- Stocking density
- Handling regimes
- Clip/rack height
- Subtidal versus intertidal

Rank (5 = most important)
How did you vary your farm management in response to POMS?

Not necessarily by choice

- Handling regime
- Stocking density in tubes/racks
- Type of stock on lease
- Placing oysters at specific times/seasons
- Farming different sized oysters
- Stopping moving stock between growing areas
- Stock amount on lease
- Clip/rack height
- No change
Are you likely to use the same farm management strategy next POMS season?

- Mostly yes, with a few changes: 76%
- Yes, no changes: 20%
- Unsure: 4%
Do you believe oyster size or age from spawning is more important in surviving a POMS outbreak?

- Age is more important than size: 40%
- Size is more important than age: 10%
- Both are equally important: 50%
- Unsure: 0%
Did you handle oysters 1-2 weeks prior to observed mortalities?

No 35%
Yes 65%

Once POMS mortalities had been observed in your growing area, did you stop handling?

No 26%
Yes 74%
Have you noticed any difference in mortality in front-runners in your stock?

Average 15% of stock are front-runners
Average 47% mortality in front-runners
Has your stocking density changed because of POMS?

- **Yes**: 84%
- **No**: 12%
- **Unsure**: 4%

Average stocking density reduction of 35% (generally not by choice)
Did you observe any differences in mortalities between the same stock at different heights in the water column?
How do you rate the viability of your oyster operation after this second summer of POMS?

- Strong: 75%
- Average: 20%
- Uncertain: 5%
- Unlikely: 0%