Sheep Blow Fly eradication on Kangaroo Island

Background: Sheep Blow Fly (SBF) causes significant economic losses for Australian livestock producers. South Australia Research and Development Institute (SARDI) researchers are developing the Sterile Insect Technique (SIT) for Sheep Blow Fly. The sterile insect technique is based on the use of sterile male flies to compete with wild males in the field, resulting in females not able to lay eggs. This technique is already widely used successfully for many fly species (such as fruit flies and screw-worm flies).

Kangaroo Island wool and sheep meat producers would gain market access and economic advantage from a SBF eradication, further re-enforcing the clean green image of the island and its potential for attracting tourism. Animal welfare will be improved and WHS risk for farmers reduced.

With current knowledge (SARDI and Macquarie University collaboration), available technology (SITplus facility Port Augusta used for Queensland Fruit fly) and existing capacity (SARDI), SIT for Sheep Blowfly could be deployed on Kangaroo Island very rapidly (Starting Spring 2022). We estimate that, if a longer-term program can be implemented, we would be able to achieve eradication of SBF from KI in 4-5 years (aim 2025).

The Sterile Insect Technology for Sheep Blowfly could be deployed on KI rapidly and cost-effectively (with timely funding and contracting) based on the following model:

1. Setting up of a modular and mobile SBF production facility on KI
    a. This can be done at relatively low costs using shipping containers or similar.
    b. Staff (will be recruited for this facility and receive training at the SITplus facility in Port Augusta.
2. Start of initial small-scale aerial release of sterile insects (pupae) in spring 2022 (September)
    a. SBF will emerge in spring following hibernation. This small spring generation initiates flystrike.
    b. Initial population of SBF will be low, based on previous work we estimate a release of 50-100 sterile males per ha and per week will be sufficient.
        i. To cover all of KI around 30-50 million flies would be needed.
        ii. This production capacity will not be reached by September 2022 but is possible by spring 2023
    c. Depending on production capacity the rearing releases can start from the east side of KI (Dudley Peninsula) in 2022
    d. In the year after, the release areas can be moved west, covering all of KI, aiming at a successful eradication over three years maximum. This is dependent on further funding for the program
    e. Aerial release can be organised from Kingscote Airport or any other existing airstrip suitable for the plane
3. On ground surveillance of SIT efficiency (trapping, flystrike observations) will be organised. This would require on-ground (local) staff that can be trained through SARDI.
4. The risk of blowflies entering KI can be limited with appropriate biosecurity protocols.

Project planning:

Currently we are working on the choice of the best site where we can install the facility for the duration of the project. The design of the facility is essential to be able to produce the volume of sheep blowflies needed for the project with optimal staffing and equipment.

To develop the mass-rearing we are aiming at developing contracts with local suppliers where needed, to produce custom made rearing equipment.

After-Project Life

After this project, the resulting rearing facility (Container based) will be re-employed for SBF suppression in other areas of SA where needed. This will also allow for eradicating possible hot-spots or re-introductions on KI. We propose, during this project, to establish a plan for the rest of Australia's sheep production areas.

SIT on the 'mainland' would require a regional approach to achieve blowfly regulation (not eradication). The economic feasibility will depend on the production costs and the density of sheep in the areas under SIT, and the re-colonisation from the environment.

We expect that, through the KI project SBF management through SIT will become more efficient and cost effective, resulting in a direct economic advantage for farmers and subsequent deployment over other sheep production regions.

The project will also be used to conduct research that would further develop the potential for SIT nationally and build capacity within Australian livestock and entomological research institutions.

Take home messages

- SARDI Entomology is developing a large-scale pilot for the use of Sterile Insect technique for Sheep Blow Flies on Kangaroo Island
- Funding through the Bushfire Recovery program will allow us to set up a production facility on KI in 2021/22 and develop the technique
- With additional funding we hope to be able to do large scale releases and eradicate Sheep Blowfly from Kangaroo Island over a 4-5-year period

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