Wool producer perceptions of their flystrike problem

J.D. Horton[1] and S.C. Champion[2]
[1]Tasmanian Institute of Agricultural Research (TIAR), Mt Pleasant Laboratories, PO Box 46, Kings Meadows, TAS, 7249.
[2]TIAR, University of Tasmania, GPO Box 252-54, Hobart, TAS, 7001.
Email: jan.horton@dpiwe.tas.gov.au

Summary

There is a widespread belief amongst Tasmanian wool producers that their flystrike problems are 'similar' to those of other producers. However, data collected showed there to be wide between-producer variation in both the level of strike experienced and in the level of tolerance to strike, i.e. the point at which the number of strikes within a flock is considered to be unacceptable, and some form of preventative measure is undertaken.

Keywords

Flystrike, survey, sheep, Tasmania

Introduction

The Tasmanian Department of Primary Industry, Water and the Environment (DPIWE) began an extension campaign relating to chemical residues in wool in 1995. This had a significant effect on the level of chemical residues in the Tasmanian wool clip, but there was a lack of knowledge as to how farmers had achieved this, and which of these strategies would be relevant for general use.

This study focussed on properties producing wool with a lower than average residue level, as the intention was to identify positive management strategies, rather than practices that should be avoided. It became evident early in this project that the participants seldom communicated with neighbours about their flystrike situation, and that most fly control was carried out in isolation despite the flies themselves being a common pest. This paper attempts to quantify the way in which participants viewed their own and district fly problem and compares it with management strategies and the estimated fly population.

Method

As part of a wider study, a group of Tasmanian wool producers were interviewed about their management practices (Horton and Champion, 2001b). Lucitrap® flytraps were used to monitor the fly population on participant farms to provide an estimate of the level of the fly population. Fly traps were sampled four times during each fly season from 1997 to 2000 to enable an assessment of the level of flies available to cause strike. Management data was collected through farmer interviews to determine the flystrike treatments planned, and small faxed surveys were used each year to assess the degree of strike and the chemicals used.

The wool producers involved in this study were selected from a trial of wool residue levels carried out in 1996 by the Tasmanian DPIWE. A list of properties were selected which were using chemical application practices enabling achievement of pesticide residues in the fleece below the maximum residue limits under proposed European Union environmental legislation. From this list, an experienced (>30 years) DPIWE wool industry field officer identified those whom he considered professional specialist wool producers who were likely to remain in woolgrowing for the duration of the project.

The list was then divided into the main woolgrowing areas of Tasmania, and two properties were selected which were relatively similar, other than that one had exceptionally low residue levels, and the other had more average residue levels (although still within the guidelines). These pairs were not identified to one another, although many soon determined for themselves who else was involved in the project.

Each participant was visited early in September 1997, before the start of the flystrike season in Tasmania. After some discussion, two sites were selected for monitor traps in areas the farmer considered were the most 'fly-prone' paddocks. These sites were also required to be near fly-strike susceptible sheep for the main part of the fly season. The traps were not moved during the season unless management needs dictated or due to unpredictable events such as trap damage due to cattle. The number of flies caught in the traps were measured in late November, January, March and May, thus providing a picture of the fly population in early- and late-spring, in summer and in autumn. The trap contents were counted in the first season, and then estimated in subsequent years (Horton *et al*., 1999). These seasons were chosen as the interviewees generally saw late spring and autumn as the main periods of fly-strike risk (Horton and Champion, 2001a).

At least once each year a single-page short questionnaire was faxed to all participants asking about the extent of the current fly problem, sheep treated that season, and the chemicals used. All data was collated by property into a spreadsheet for each year.

The initial participants were followed for three fly seasons. In the second year, some extra pairs of producers were selected from the original list, using the same process, to widen the geographical scope of the study. In the third year further individual properties were added to address particular issues which had arisen during the course of the study. These included properties already using fly traps and 'organic' sheep operations. All participants continued through until the end of the project.

The majority of the properties ran Merinos, although some ran Polwarths. Most ran approximately equal numbers of ewes and wethers until a severe drought affected Tasmania (especially the State's southern regions) in 2000 and resulted in a significant drop in wether numbers. In addition, many of the participants also had a prime lamb enterprise, and there were a number of commercial studs in the sample group.

Results

The data collection was not complete due to both physical losses of some traps and the pressure of work limiting returns from participants in some cases. However, all data sets contained sufficient results for analysis.

Fly population estimates

Most properties had two traps, (in some cases three or four), and on some occasions the traps were damaged so that no flies were caught. The number of lies trapped is extremely skewed and any missing data could be from a high or low-fly period so that season averages for fly numbers could be unsatisfactory. Therefore for each round of collection the number of flies in each trap was placed in rank order, and then for each trap an average rank score was calculated for the whole period. Despite wide variations in fly catches over the seasons and in different years, there was a strong tendency for individual trap catches to remain in approximately the same rank position. This indicated that the fly population stayed relatively constant for any particular property, although it could be quite different on neighbouring farms. To put these findings in perspective, the average number of flies per trap for each group has been calculated, but it should be noted that this was not the way the properties were allocated to the groups.

Table 1. Fly population estimates.

Rank percentile	Number of properties	Fly Population	Average fly catch/trap
0-25	6	Low	177
26-50	18	Medium low	403
56-75	26	Medium high	1334
76-100	8	High	2917

The maximum fly catch in one trap was approximately 20,000 flies (over 2 months), and the maximum for a season was about 50,000 flies in the one trap.

Perception of fly population

Participants were asked during the interviews how they saw their fly problem, and also how they saw it in relation to the severity of the problem in the district. This proved to be a difficult question, as most saw their fly problem as 'average', although many of them did not actually feel able to comment on the extent of the fly problem on neighbouring properties as they had never discussed the matter with their neighbours. (Only 10 of the 39 who answered this question had talked to others in their district about flystrike.)

Table 2. Participant perception of flystrike incidence.

Perception of own flystrike	Number of properties	Fly population (ave. rank)
Low	6	46.0
Average	40	55.9
High	3	70.6

Those who saw their problems as particularly low did have a lower than average fly population. However, they were not generally in the very lowest population group. Those who saw themselves as having a high problem did have a relatively high fly population, but again, there were properties with higher fly populations where they still felt the problem to be average.

Sheep chemical protection regime

Chemical treatment was planned on a regular basis on the majority of properties, but this was in most cases under constant review. The chemical used, the mode of application, the sheep classes to be treated and the time of treatment were all being changed over the four years of the study on a large number of the properties. This was due to the economic situation, changing alternative enterprises, the perceived fly risk and the increased level of interest in reducing chemical residues in wool.

As a very general classification, the properties were rated according to their strategy for the 1999/2000 summer. This was the **planned** treatment, and in some cases further treatment was applied where serious fly problems arose later in the season. Some properties applied an off-shears insect growth regulator as a backliner in spring specifically for fly control, although in some cases they did consider it was protecting against lice as well. These properties were counted in the 'backliner' group even if they also used jetting for some of the sheep.

The 'most susceptible' sheep were generally either the weaners or the 2-tooths, and sometimes both. In some cases only the ewe hoggets were treated, and on other properties the young wethers were included in this group.

Rams were not included, as most properties treated them early, often, extensively, and sometimes with a different chemical from that used on the rest of the flock.

Table 3. Chemical protection strategies.

Strategy	Number of properties	Fly population (ave.rank)
None	8	37.5
Most susceptible sheep only	14	56.5
Everything except the wethers	11	56.4
All sheep	18	59.4
Backliner	4	53.7

The group which did not routinely treat any sheep appear to have a lower than average number of flies caught in the traps. Of this group of eight, three were those who considered their fly problem to be low and therefore appear well attuned to their ecosystem. Apart from this there was no apparent difference between the properties with different chemical treatment regimes and their fly populations.

Although the numbers in the individual categories are small, there does appear to be a relationship between the properties where no sheep receive any chemical treatment until strike occurs, and a lower fly population. There is no way to tell from this project whether the experience of a low fly population has allowed the development of this strategy, or whether the strategy has influenced the fly population.

Deciding when to apply a flock treatment for flystrike

Participants were asked how many cases of strike in a week would be needed before they resorted to a flock treatment (either crutching/shearing or chemical application) for the sheep concerned. These replies were then rated as 'small numbers struck' (1-4 cases), 'medium numbers struck' (5-15 cases), or 'many struck' (>15). The largest number suggested was 200 struck sheep in a week, and 20%-30% of a mob was mentioned in several cases. This response was related to flystrike occurring **after** the normal protective treatment which was applied (see Table 3) on many of the properties.

Table 4. Flock treatment after strike occurs.

No. sheep struck before flock treatment considered	Number of properties	Fly population (ave. rank)
1-4	14	53.9
5-15	15	43.5
>15	15	64.6

The properties which chose to wait until a moderate number of strikes were recorded appeared to have a lower fly population than either those who treated as soon as strike was seen, or those who waited until a large proportion were struck.

Flystrike incidence

The level of flystrike on each property was estimated in various ways after it became obvious that the farmers did not have time to maintain paper records for the project. Instead, they were asked to rate their flystrike as low, medium or high during the interview, and also they were asked by fax survey each year to provide an opinion on flystrike severity, rated on a five point scale from one to five. It was found that they were mostly rating the season as low to very low, even though they may have earlier mentioned a period of high strike incidence. It would appear that strike periods in Tasmania tend to be of short enough duration that they are not remembered for very long.

Table 5. Perception of flystrike incidence.

Flystrike incidence	Number of properties	Fly population (ave. rank)
Very low	8	54.7
Very low to low	9	45.2
Low to average	21	51.1
Average to high	7	60.1
High to very high	0	-
Very high	0	-

These low results are interesting given that a number of properties did report high strike incidence anecdotally while the traps were being visited, but later rated the seasonal incidence as low. It is possible that they tend to be too busy in a high fly period to fill in survey sheets, and this biases the results.

Discussion

Although the participants in this survey were all good managers, there were only a small number who seemed to really understand their fly problem. There was a large variation in flies caught, possibly due to the very diverse ecosystems across Tasmania. Despite this, none of properties in this survey were producing wool with high residue levels (Barr, *pers. comm.*), and were actively pursuing many strategies to reduce the need for chemical applications (Horton and Champion, 2001b).

The properties could be divided into three groups according to the strategy practiced in bad fly conditions when flystrike started to develop, whether or not the sheep had already been treated with chemical. Flock treatment in the face of a possibly approaching flywave was generally either jetting or crutching (or shearing for body strike).

Some participants elected to act as soon as the first affected sheep were seen, and thus while most of the mob was still clean (the '1-4' group). This strategy ensures minimal wool losses, but is an expensive option, and the chemical treatment is required entirely as a fly deterrent. This group also tended to treat most or all of the sheep in advance, and probably are driven mostly by the lack of labour available to treat individual struck sheep due to pressure of alternative enterprises and in particular, the time requirements of irrigation systems.

Some participants waited until a reasonable number had been struck in a short time. This '5-15' group often referred to their limit as 'half a dozen', or 'a dozen' rather than a precise number, and the decision to treat was taken after careful consideration of the weather and all other relevant factors in the hope that the treatment would not ultimately be necessary. In the meantime, individual sheep were treated and sometimes stock moved in an attempt to avoid treatment. If flock treatment is carried out under these conditions there are likely to be a number of sheep with covert strikes in the mob and hence maggots on the sheep that need to be killed, in addition to the deterrent effect of the treatment.

The final group consisted of those participants who preferred to take a higher risk, and who waited until a much greater number had been struck before considering flock treatment ('>15' group). Overall, they may use less chemical, as in most cases the weather breaks before their limit is reached. But when they do have to treat, a large number of the mob is likely to have either overt or covert strike, and wool losses may be severe.

Each of these strategies has different merits, but it does appear likely that the 'middle of the road' group may have a lower fly population. Possibly those who wait longer before acting face the risk of maggots surviving to pupate off the living sheep, and those who treat promptly may be reacting to a known higher fly risk.

Different extension strategies are required to assist these differing groups of wool producers. No one set of advice will be useful to every producer, but for all of them it is necessary to understand the nature or extent of their fly problem as well as the degree of risk they are prepared to accept.

Conclusion

Wool producers should be encouraged to understand their own ecosystem and to manage flystrike accordingly. If there is a low existing fly population then it may be feasible to decrease chemical protection. However, this needs to be done with understanding of the risks involved as it may lead to an increase in the fly population if more strike occurs on the unprotected sheep. Monitor fly traps are one way of assessing the situation, but sheep managers need a variety of tools to help them assess their own situation on a regular basis.

References

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