Application: Two-fold lessons can be learnt from this pilot project; the successes that can be achieved through the collaborative nature of the project from farmers to funders, and the documentation of previously unrecognised levels of sheep scab present in Northern Ireland highlighting the need for a sustainable control programme to be developed.

Introduction:

Sheep scab (hereafter, scab), caused by the ectoparasitic mite, *Psoroptes ovis,* is highly infectious and can cause significant detrimental impacts on welfare sheep and emotional stress to farmers caring for them (Crawford, P E. *et al.,* 2022). Scab is present in Northern Ireland (NI) and is currently a notifiable disease. However, limited data exists on the prevalence or distribution of the disease (Crawford, P E. *et al.,* 2022). A farmer-led group, concerned about the spread of scab, working in NI since 2019, obtained, in partnership, funding from BBSRC through its endemic livestock disease programme to undertake on-farm investigations of suspected cases of scab alongside knowledge exchange (KE) activities (Crawford, P. E. *et al.,* 2023) as a pilot study to inform future disease control efforts.

Materials and Methods:

Following KE meetings with veterinary surgeons (vets) and farmers, a target was set to engage 100 farmers who considered they may have scab in their flock, or suffered a recent, high-risk, incursion. The programme funded the farmer’s private vet to visit the farm, undertake a risk assessment, examine sheep, and obtain diagnostic samples. The vet also advised the farmer on scab prevention and treatment.

Blood samples were taken to detect recent scab exposure via a Pso o2 antigen-based ELISA (Burgess *et al.,* 2012). If visible lesions were identified, the vet was encouraged to take skin scrapes in addition to the blood samples. Even if light microscopy detected live mites, vets were requested to take blood samples to provide a baseline titre to which subsequent serology could be compared if a suspected failure of treatment efficacy arose.

Farmers whose flocks were positive were offered support for the purchase of medicine for flock treatment, up to a financial limit, and in certain high-risk scenarios, some flocks that tested negative were also offered preventative treatment.

Results:

Farmer engagement exceeded project aims, with over 150 farmers enrolling with the scheme and others contacting the helpline or team members privately. These private contacts were mainly driven by farmers seeking advice but unwilling to formally commit to the scheme, because they were reluctant to disclose their flock status to state authorities.

Visits were undertaken on 105 farms. Uptake was from farmers around NI, which resulted in vets from 39 different practices/ branches assisting in the scheme's delivery. Scab was confirmed by light microscopy and/or blood samples, in 60 flocks, with their locations shown in Figure 1. In addition, 7 flocks were assigned for further monitoring or testing because initial test results proved equivocal. Blood testing proved vital for detecting scab. Of the 22 flocks which had clinical signs but a negative skin scrape, only five were negative when blood tested.

Plunge dipping in diazinon emulsion was the recommended treatment. Among the sixteen flocks treated with the injectable macrocyclic lactone (ML) products, five subsequently had to be dipped because clinical signs persisted, raising a concern about the failure of treatment efficacy. It was impossible to obtain sufficient live mite samples from these flocks to prove whether the efficacy failure was due to ML resistance. However, suboptimal application (injection) technique and failure to maintain adequate biosecurity were identified in flocks that had used injectable techniques to manage scab.

Scab was identified in some flocks which had access to common grazing, and preventive plunge-dipping was offered to these flock owners, regardless of the results of their flock investigation on the proviso that such treatments were all undertaken in co-ordination with other flock-keepers and before any sheep were returned to the common. Compliance with the scheme’s advice on clearing the common and treating all sheep in a coordinated manner was considered to be good.

Post-programme interviews with participating farmers and other stakeholders revealed their relief that someone was tackling scab, that the programme managers were keen to work with the farmers and finally, that the taboo about scab was being broken.

Conclusions: The success of the scab group in identifying funding and developing partnerships to deliver the on-farm investigations highlights how researchers, and those funding research can positively impact animal health and welfare by listening to the call from farmers for help with their concerns. The levels of scab identified by the pilot project demands, based on animal and farmer welfare, a concerted effort to identify a sustainable approach to scab control in NI.

Acknowledgments:

BBSRC award (BB/W020521/1) for funding the NI sheep scab programme.

Figure 1: Geographical location of flocks participating in the project in which scab was detected (red dots) and those where scab was not confirmed (blue dots).

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