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The clover root-knot nematode, *Meloidogyne trifoliophila* (Nematoda: Tylenchida), is common in pasture and severely debilitates white clover. The potential payoff of genetic resistance to nematodes is substantial as it will improve white clover's performance and persistence. Plant breeders have developed lines with resistance to the clover root-knot and the clover cyst nematode. The resistance to the root-knot nematode is multi-genic and conferred by recessive factors making deployment a challenge in this outcrossing forage clover. Therefore, it is difficult to use selection based on observed trait expression to migrate the key genes into and among commercial lines. DNA tests for use in marker-aided selection would allow selection of resistant material earlier and cheaper than current methods. Plants sampled from a F_1 mapping population exhibiting genetic variation for resistance and susceptibility were screened in a controlled environment for reaction to the root-knot nematode. DNA samples from the most susceptible and most resistant progeny were bulked and tested with DNA markers from throughout the genome. Analysis showed that two regions of the genome contained markers that are polymorphic between the bulks. We are currently phenotyping and genotyping a large (n = 154) random sample of the mapping population which will allow estimation of QTL effects in these regions of the genome.

Is the *H. contortus* ES product which vacuolates HeLa cells a prostaglandin or lipid?

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Vacuolated parietal cells have been observed in tissue sections from parasitised sheep, and *in vitro* preparations of *Haemonchus contortus* excretory/secretory (ES) products are able to induce vacuolation in HeLa and AGS cells. The mechanisms and active components have not yet been identified, although different components of ES products are being tested as possible candidates. Prostaglandins play a role in many biological processes, including host-parasite interactions, and are synthesised by both host and a number of parasites, including nematodes. Prostaglandins have been reported to be involved in vacuole formation in protozoa, but it is not certain whether prostaglandins are capable of vacuolating mammalian cells or playing a role in the pathophysiology of nematode parasitism. The aim of this study was to separate lipid components of adult *H. contortus* ES products and assess their possible role in vacuolation of HeLa cells. Lipids in ES products were separated by thin layer chromatography (TLC) with phosphomolybdic acid staining and commercial prostaglandin standards (PGA_2, PGB_2, PGD_2, PGE_2 and $PGF_{2\alpha}$) used as a reference. ES product lipids were additionally identified by SDS-PAGE with Sudan Black staining. The prostaglandin standards were also tested on both HeLa and AGS cells cultivated on glass cover slips and the formation of vacuoles microscopically examined using Neutral Red. Lipids, but not prostaglandins, were detected by TLC and these spots were excised and tested for vacuolating activity in HeLa cells. Several lipid bands were also detected by SDS-PAGE. None of the prostaglandin standards or ES product lipids were able to induce vacuolation. These results show that it is very unlikely that the lipids in *H. contortus* ES products are responsible for vacuole formation in HeLa cells.

Variable experience of parasitism by five ram lamb mobs grazing the same pasture

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