

**Effect of a non-ionic surfactant on the uptake and translocation of  $^{14}\text{C}$ -asulam in bracken under field conditions**

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Correct application of 'Asulox' by helicopter to mature bracken fronds generally results in good control of new frond growth the following season. It has been noted that the uptake of asulam by the sprayed fronds can be relatively slow. Addition of a non-ionic surfactant ('Agral') to the spray at a concentration of 0.1% does not increase the amount of 'Asulox' spray retained by the fronds but generally may increase greatly the rate of uptake of asulam by the fronds. Use of  $^{14}\text{C}$ -asulam has shown that there is no change in the efficiency of translocation of asulam out of fronds and into the rhizome system associated with the addition of surfactant to the applied asulam solution. The translocation of  $^{14}\text{C}$ -asulam out of treated pinnae amounted to 60–80% of the uptake into the pinnae.

$^{14}\text{C}$  was detected in frond buds up to 2m away from fronds treated with  $^{14}\text{C}$ -asulam. The concentration of  $^{14}\text{C}$  in frond buds on a rhizome attached to a frond treated with  $^{14}\text{C}$ -asulam was much lower where they were adjacent to a frond not treated with  $^{14}\text{C}$ -asulam. This emphasises the importance of good spray coverage on the fronds in achieving good control of bracken.

**Polymorphism for cyanogenesis in British bracken  
(*Pteridium aquilinum*, subsp. *aquilinum* var. *aquilinum*)**

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Cyanogenesis, the release of cyanide from damaged tissue, occurs in many plants (Conn 1980) and in some the character is polymorphic because, on the basis of a simple field test, some individuals are apparently acyanogenic. Bracken is a cyanogenic species (Greshoff 1908) and limited studies at two locations in England have recently revealed it to be polymorphic (Cooper-Driver and Swain 1976; Lawton 1976). Our investigation has been initiated to study the occurrence of cyanogenesis in bracken throughout Britain and to determine the basis for the polymorphism.

In 9 locations throughout mainland Britain, well-grown bracken stands were selected in 3 different habitats: woodland, open field or heath and, where available, coastal sites. At each location, the chosen sites were as close as possible to minimise the effects of other factors. At each site, an 18 m × 18 m grid was marked out and 50 or 100 fronds sampled at regular intervals. The terminal 4 cm of the lowermost pinna of each frond sampled was tested in a 50 × 12 mm stoppered tube by the modified sodium picrate test for HCN (Jones 1966). The bright yellow test paper changes colour in the presence of cyanide, becoming pale orange to chocolate brown