Grazing Sheep On Deadly Fireweed: A 'BaaaaD' Situation?

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Senecio madagascariensis (fireweed) is of global significance, due to its rapid spreading ability, productive and economic impacts and toxic pyrrolizidine alkaloid (PA) content. PAs accumulate when consumed and are the leading plant toxins associated with disease, occasioning death, in animals and humans worldwide. Sheep readily graze fireweed and are therefore promoted worldwide as a reliable form of control; however, my previous research suggests sheep may be ineffective. Accordingly, I investigated whether sheep spread fireweed, if PA's affect sheep health and whether accumulated PAs enter the human food chain. 2 different manure collection methods resulted in 213 fireweed plant germinations, proving sheep are capable of spreading fireweed. Appropriate sheep grazing management strategies must be implemented, as ineffective practices contribute to the rapid spread of fireweed, increasing the possibility of global food contamination. Blood tests were conducted on 50 various aged sheep exposed to fireweed since birth, to identify impaired liver function. The 10 worst and 2 best-testing sheep then underwent visual liver assessment, liver histopathology and copper level analysis. Minimal evidence of impaired sheep health was found, suggesting sheep can safely graze fireweed densities of ~9.25 plants/m2 for 6 years. Liver and tissue samples from these 12 sheep were then tested for PA accumulation. Toxic Florosenine was found in 3 tissue samples at levels up to 0.5µg/kg. Considering fireweed densities of 5,000 plants/m2 exist, further investigations into greater fireweed density and PA accumulation is necessary, as sheep grazing ~9.25 plants/m2 resulted in deadly toxins being served up on unsuspecting dinner plates!

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