Cutting it fine – Blood Pattern Detection on Grass.

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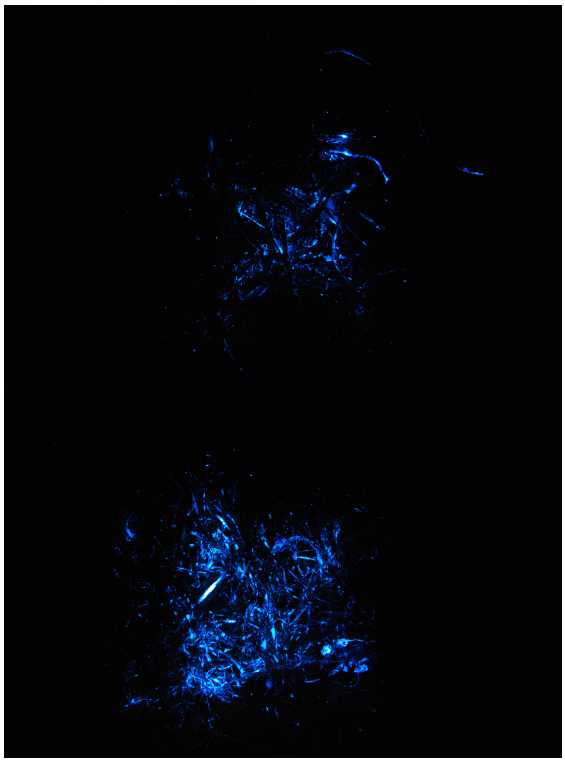
Forensic natural science disciplines such as forensic soil science, forensic palynology, and forensic botany, often have to operate outdoors where the environment introduces a myriad of variables that can affect the post-depositional fate of trace evidence. In the case of bloodstain pattern analysis, little research has been carried out on the effects of the outdoor environment on the survival and degradation of bloodstains deposited on various natural surfaces. A review of research to date indicated that what has been done has been limited to the detection of blood patterns on bare earth using luminol, a chemiluminescence reagent that, with iron in haemoglobin acting as a catalyst, reacts with an oxidising agent to produce a distinctive blue glow. Grass, despite being a vegetation cover commonly encountered at outdoor crime scenes, is a surface for which no previous research on the degradation and detection of bloodstains by these methods has been published.

To study the preservation of bloodstains on grass, blood patterns were deposited on test plots and exposed to the elements for 2, 6 and 10 weeks. After these time intervals, the samples were tested with the successor to luminol, Bluestar® Forensic. The results show that although the visibility of the bloodstains was significantly affected by rainfall, a chemiluminescence reaction was detected with Bluestar® Forensic on all of the samples tested. As would be expected, the older the bloodstains the less intense this reaction became. However, cutting the grass back to a height of approximately 1 cm above the soil significantly enhanced most of the reactions (fig .1) as blood residues had been washed onto the lower parts of the blades and surface of the soil while broadly retaining the patterning of the original deposit. Furthermore, for some samples, a reaction was detected 2cm down in the soil.



This research has demonstrated the value of Bluestar® Forensic to detect bloodstains that are up to 10 weeks old deposited on grass and soil, the significance of cutting back the grass for to enhance detection, and the transport of blood residue into the soil profile. As well as extending the time intervals for this experiment, it is suggested that further work should look at blood pattern survival on a wider range of vegetation and soil types, on other natural surfaces (e.g. rock), together with investigating the rates of transport of blood residues into and through soil profiles, and how best to minimise destruction and maximise evidence recovery in such situations.

Fig. 1 *Chemiluminescence reaction from blood on grass, prior to and after cutting the grass to a length of 1 cm (Photographed with a Nikon D40 digital camera)*