

Title Improving sooty blotch and flyspeck severity estimation on apple fruit with the aid of standard area diagrams

Author Piérri Spolti, Luana Schneider, Rosa M. V. Sanhueza, Jean C. Batzer, Mark L. Gleason and Emerson Medeiros Del Ponte

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Abstract

Sooty blotch and flyspeck is caused by numerous species of fungi that colonize the surface of apple fruit and thereby lower its market value. Although this disease poses a substantial threat to apple growers' profitability in some regions, reliable and cost-effective methods for epidemiological and disease control studies have not been validated, nor are they widely available. We modified a standard area diagram to aid sooty blotch and flyspeck severity assessments and quantified its impact on accuracy and precision of visual estimates. Samples of 'Fuji' and 'Mutsu' fruit were photographed both from the top and laterally. Severity was assessed from a sub-sample of 160 images using image analysis software. Validation of the diagram was performed by eight raters who independently assessed severity in two series of selected images representing the lateral view and the top view, initially unaided and subsequently with the aid of the scale. Severity estimates ranged from 0.4% to 98% (most fruit had <10% severity). Accuracy and precision of the estimates were significantly improved when using the diagrammatic scale; concordance correlation coefficient values increased from 0.81 to 0.95. A strong tendency to underestimate severity for the mid-range to high levels was minimized when using the aid, which also improved reproducibility of the estimates among raters. In addition to strengthening evidence that a standard area diagram can be used reliably in sooty blotch and flyspeck studies, we expanded its application to disease assessment in the peduncle region, which enhances the usefulness of the method for evaluating efficacy of management practices.

<http://www.springerlink.com/content/x77512p2u2839530/fulltext.pdf>