#109

Results of a Beta Test Evaluating Automated Pollen Identification During Ragweed Pollen Season

D. Dalan [1], J. Anderson [2], L. Bunderson[3] , R. W. Lucas [3,4] 1 Allergist St. Paul, MN, 2 Department of Environmental Health Sciences, 3 Pollen Sense™ , Provo, Utah, 4 Southwest Environmental Institute, Phoenix, Arizona .

Abstract

Rationale: Innovative technology may help advance the mission of the AAAAI and National Allergy Bureau (NAB), but new technology must be validated. We compared pollen counts collected during a beta test of an automated pollen sampling device (APS) and reports on social media with those obtained from a Burkard and NAB Rotorod. We report the initial results from a field test of the APS for ragweed pollen only during the autumn season.

Methods: A Burkard sampler (BS) was co-located side-by-side with the APS in Eagen, Minnesota. Our site is 20 miles from a NAB station (Rotorod). Pollen collection, processing, and identification were performed following NAB requirements. The APS was provided by Pollen Sense™. The APS collects particulate matter volumetrically from ambient air, automatically images the particulates, and uses a convolutional neural network to identify pollen species. Species counts from the APS are reported hourly. Total pollen, ragweed counts, and data from social media (SM) allergy reports were obtained from the BS, the APS, the Rotorod, https://criminnesota.com/volunteer/pollen-count , and https://weather.com (WC).

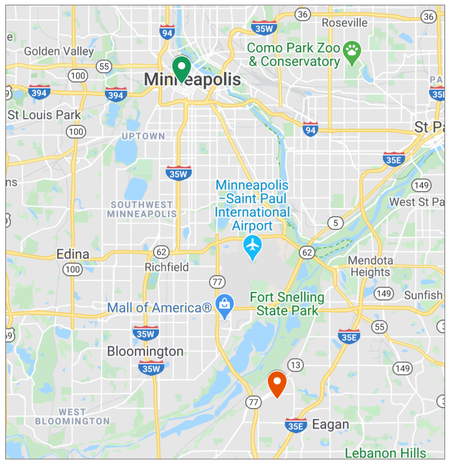


Figure 1. Images of: a) the exterior of the APS-330; b) the interior of the APS-330; c) placement of APS and Burkard (red) and NAB Rotorod (green).

Images Captured with the APS-330

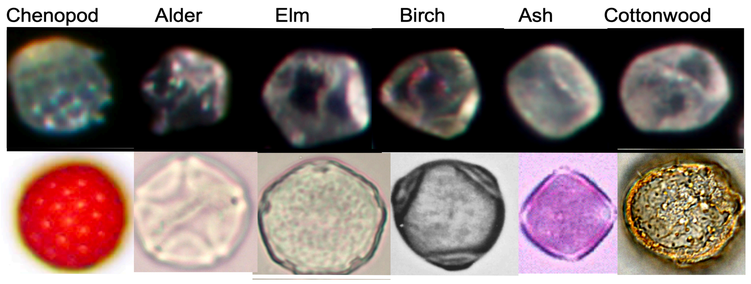


Figure 2. Comparison of genera imaged with a) Pollen Sense APS-330 and b) conventional light microscopy.

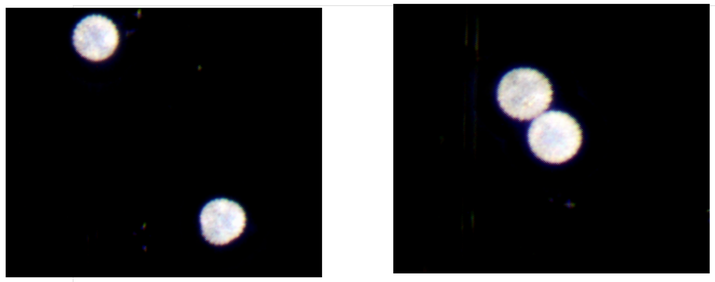
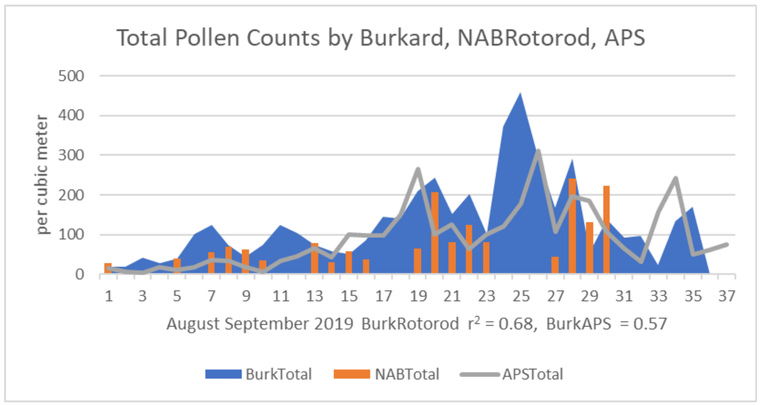
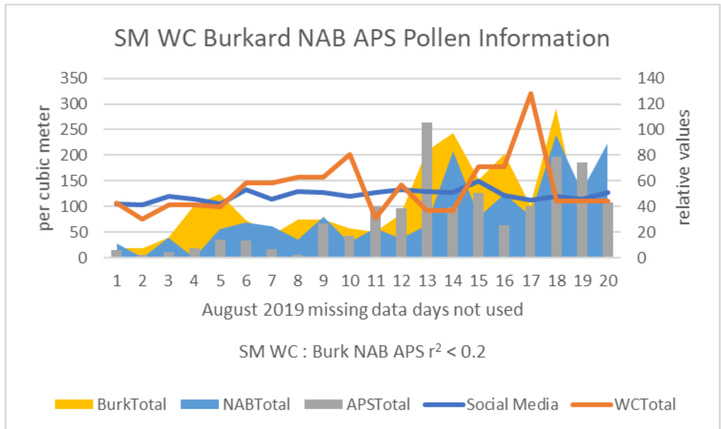
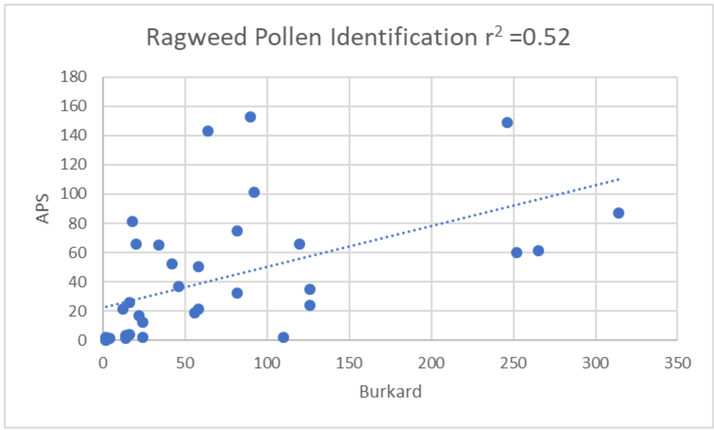


Figure 4. Examples of raw ragweed images captured with an APS-330.







Conclusions

1. Total pollen and ragweed counts provided by an APS demonstrated high positive correlations compared with the gold standard Burkard sampler and NAB Rotorod.
2. Low degree of correlations occurred with the sampling devices compared to Weather Channel, and social media pollen information. .
3. Continued field testing, validation with precision improvements for ragweed as well as other representative pollen types during additional pollen seasons are recommended before widespread use.

This project was funded by Pollen Sense, LLC and Dan Dalan