Bridging the gap: engaging citizen scientists via a community outreach program—VegeSafe

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Translating complex science to a non-scientific audience is a barrier often faced by researchers. Researchers must break this barrier in order to educate the public, translate knowledge and stimulate change. Communities that are engaged with the scientific process are more connected with outcomes and knowledge generated by research. Macquarie University's free soil metal testing program 'VegeSafe' is an Australia-wide citizen science initiative informing gardeners about contaminant hazards in backyard soils. The program utilises portable X-ray fluorescence spectrometry to screen participants' soils for contaminants including Pb, As, Zn, Mn and Cr. Participants receive a soil report and advice on what to do next. VegeSafe engages with the community via a range of events such as farmers markets, garden shows, special forums and the media. This engagement 'bridges the gap' between research and public interest in environmental contaminants—increasing the likelihood of intervention by gardeners. VegeSafe has assisted >1,500 participants, translating to analysis of ~8,000 soil samples. Lead in soil has been identifed as the primary contaminant of concern because of its known toxicity. Inner Sydney soils have elevated Pb concentrations (range: 14–3,080 mg/kg), with 26% of vegetable gardens exceeding the 300 mg/kg guideline. Participants have invested in raised vegetable beds, clean soils, geotex covering of contaminated soils, paint removal and Pb testing of domestic chickens and their eggs after receipt of VegeSafe data. One home owner spent AUD$20,000 remediating their backyard.

Sources of contamination include the former use of Pb-based paint on exterior walls, age of property and proximity to roadways where leaded gasoline depositions were greatest. The reach of VegeSafe has been significant—the program and its results have been discussed in the NSW Parliament, national television, radio, newspapers, home and gardener magazines and also in online media outlets. The program's visibility has helped educate home owners and gardeners on soil geochemistry and broader environmental health risks. Moreover, the program has generated Australia's most comprehensive dataset of metal(loid) contaminants in backyard soils.