HEALTHY FOOD SYSTEMS • HEALTHY ENVIRONMENTS • HEALTHY COMMUNITIES • HEALTHY CALIFORNIANS

University of California
Agriculture and Natural Resources
Making a Difference for California

UC CE

The Green Scene

May 2024

Meetings and Announcements

Next Horticultural Tour

It has been almost 20 years since I offered our first horticulture study tour. That was in 2005, and these tours have certainly been enriching and beneficial for me and for my work.

In cooperation with Travel Gallery of Pasadena, I do plan to offer our next horticultural tour to northern Spain and northern Portugal. We have decided to not offer a hort tour this fall, but plan to move the program to the last week of April and first week of May, 2025. A Travel Gallery representative is currently in Spain, and what he learns will help us tune what we offer.

I also mention that I intend to offer a horticultural tour to Japan in spring, 2026. Japan has superb examples of garden design, and one of the world's premier rose gardens is there, which I visited in 2009 as part of an international rose symposium.

Master Gardener Program

UC Cooperative Extension in Kern County has received funding for a Master Gardener (MG) coordinator, and that position is under recruitment. I have attached a position announcement and hope we will find a suitable individual soon. If you are interested, please contact the UCCE Kern County office, 661-868-6200, or via the contact information in the announcement.

Also, if you are interested in becoming a Master Gardener volunteer, please call our office, 661 868-6200, and let us know. We are currently keeping of list of those interested for future notification. I've spoken to a number of Master Gardener class groups in other counties. People enjoy the learning and the social interaction within the group

A Master Gardener volunteer is someone who has completed class work, approximately 10-12 class sessions of 3 hours per session and passed a written test. Then, a number of volunteer hours will be scheduled. I don't have cost information at this time.

We don't have a coordinator yet, so the start time for this program is currently undecided. One might guess September or October, more or less in synch with the school year. Again, if you're interested, we can let you know.

Transition to Battery-Powered Lawn Equipment in California

The implementation date for the changeover from gasoline-powered to battery-powered mowers and lawn equipment has begun as of January 1. AB 1346 phases out the sale of small gasoline-powered equipment, including mowers and leaf blowers.

Let me offer the following background.

The changeover from gasoline power to battery power is not about reducing greenhouse gases, CO_2 principally. It is about reducing amounts of air pollutant precursors entering the atmosphere. These react to form ozone (O_3) and secondary organic aerosols (particulates) through photochemical reactions. (Ozone in the upper atmosphere is produced via a series of reactions called the Chapman Mechanism. It absorbs ultraviolet (UV) light and thus protects us, animals, and plants, from short-wavelength UV. Hence, the concern about ozone destruction, the springtime "ozone hole" over the Antarctic. This ozone we want.)

Ozone in the lower atmosphere and at ground level is considered to be a pollutant, with deleterious effects on lung function, plants, and materials. If you remember visits to or living in LA in the 1960s or 70s, you may recall eye irritation and a feeling of a tight chest from the air pollution then. We might remember looking north in Pasadena and not being able to see Mt. Wilson. Air quality is better now, and the California Air Resources Board (CARB) regulations as a result of research have been effective in reducing both ozone and aerosol formation.

Although low levels of ozone are found in the unpolluted atmosphere, anthropogenic emissions of nitrogen oxides (NOx) and hydrocarbons (volatile organic compounds, VOC, also called reactive organic gases, ROG) provide additional source strength for atmospheric photochemical reactions. To limit formation of ozone, it is necessary to limit the emissions of these reactants, since once in the atmosphere we cannot capture them. So, for decades CARB has been constructing emission inventories; these allow the agency to look at sources of emissions and their quantities so that regulatory policy can be developed.

I think we are all familiar with catalytic convertors on automobiles, not necessarily how they work, but that they are present (and expensive to replace if stolen). California led the way in requiring catalytic convertors on cars, which have greatly reduced emissions of unburned hydrocarbons, nitrogen oxides, and carbon monoxide. They have been effective in improving air quality in California.

I have a .pdf of a CARB report, the cover of which I show to the right. It is 119 pages. I want to thank Megan McKay of that agency for finding and sending this report to me. This report is about small off-road engines, SORE, and details the data and methodology for obtaining the data that ARB has used.

I want to quote from the Executive Summary, which I reproduce here:

1. Executive Summary

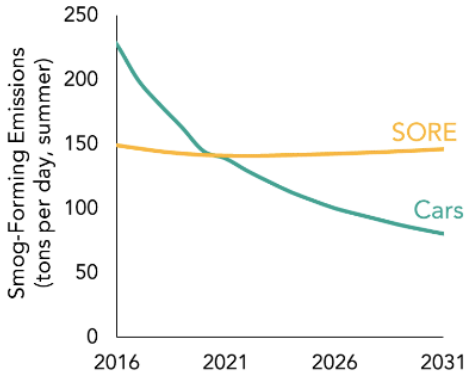
Small off-road engines (SORE) are spark-ignition engines rated at or below 19 kilowatts (i.e., 25 horsepower). Engines in this category are used in lawn and garden equipment as well as other outdoor power equipment and specialty vehicles and cover a broad range of equipment such as lawn mowers, leaf blowers, chainsaws, and generators. The majority of this equipment belongs to the Lawn & Garden (e.g., lawn mower, leaf blower) and Light Commercial (e.g., compressor, generator) categories of the California Air Resources Board's (CARB) SORE emissions inventory model. This document details the updated baseline emissions inventory as utilized in CARB's SORE emissions inventory model, SORE2020, which will be used to inform future regulatory development as well as air quality and climate change planning efforts (e.g. State Implementation Plan or SIP and Climate Change Scoping Plan).

I also offer a quote from p7 of this document, emphasis added:

Most of the SORE are gasoline powered and therefore they are a significant source of ROG and NOx emissions, which are precursors to smog. Though major progress has been made in reducing ROG and NOx through exhaust emission standards implemented between 1995 and 2008 and evaporative emission standards implemented between 2006 and 2013, **emissions from SORE are still higher than the emissions emitted from the 14.4 million passenger cars operating on California roadways.**

I find this statement extraordinary, and it does explain the interest in moving to electric rather than gasoline-powered small equipment. That statement indirectly says just how effective automobile catalytic converters are.

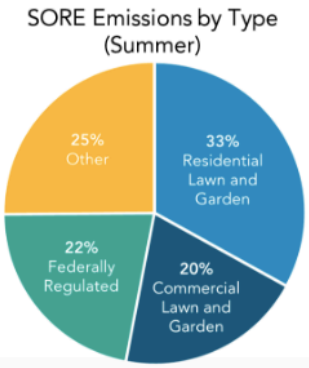
Let me also offer a few screenshots from the CARB small engine fact sheet on this topic, https://ww2.arb.ca.gov/resources/fact-sheets/sore-small-engine-fact-sheet. The first figure below is a general summation of emissions from cars vs small engines in California. It echoes the statement above regarding the relative amounts of emissions from these sources.



Here is a descriptive statement and figure showing SORE emissions by type.

Small Off-Road Engines in California

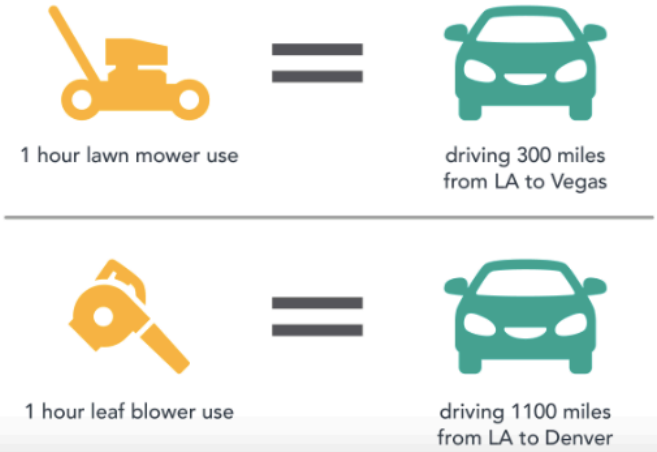
Small off-road engines (SORE) are spark-ignition engines rated at or below 19 kilowatts. Engines in this category are primarily used for lawn, garden, and other small off-road equipment. The population of SORE in California (15.4 million) is similar to that of light-duty passenger cars (14.0 million). As of 2021, 61% of California SORE are used in residential lawn and garden equipment, 8% in commercial lawn and garden equipment, 11% in federally regulated construction and farming equipment, and 20% in other equipment types (e.g., generators, pressure washers). While commercial lawn and garden equipment are only 8% of the SORE population, they account for 20% of smog-forming emissions from SORE during the summer.



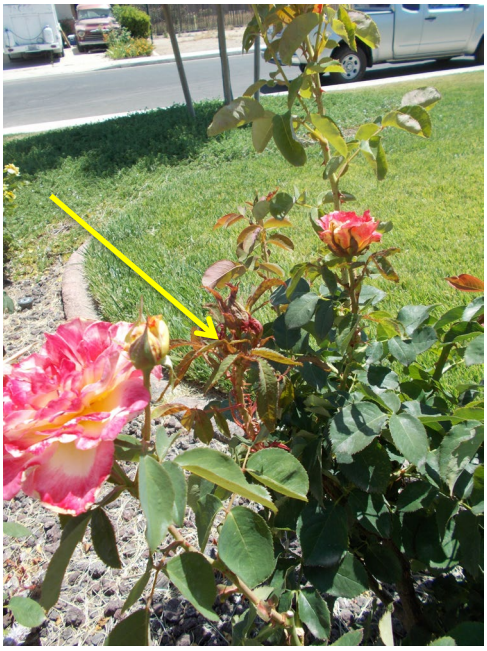
And finally, a comparison between a car and small equipment. We recognize there are different engine sizes for small equipment and cars, so this figure is generalized. Cars are very clean these days with regard to VOC and NOx.

Emissions are significant

Today, operating a commercial lawn mower for one hour emits as much smog-forming pollution as driving a new light-duty passenger car about 300 miles – about the distance from Los Angeles to Las Vegas, more than 4 hours of drive time. For a commercial leaf blower, one hour of operation emits smog-forming pollution comparable to driving a new light-duty passenger car about 1100 miles – about the distance from Los Angeles to Denver, over 15 hours of driving.



Rose Rosette Disease



As a reminder, we are on the lookout for rose rosette disease!

Rose rosette disease (RRD) is a destructive disease of roses caused by a recently identified virus. The virus is transmitted by a very small (microscopic) eriophyid mite. RRD is always fatal to a rose plant, although the length of time to kill the plant varies up to perhaps three or four years. RRD has been a major problem in some eastern U.S. states but not in California. Identification and removal of infected plants can safeguard other roses in the landscape, as well as protecting Kern's rose plant crop.

Please be on the lookout in rose plants in your landscape or that you see in public parks or commercial plantings for the early RRD symptom of excessive thorniness (two photos to the right), multiple terminal shoots (called witch's broom), and in a very late stage, the bright red of terminal foliage. I have posted three papers to our UCCE Kern County website (cekern.ucanr.edu) under the heading "Environmental Horticulture/ Environmental Science" that give further information and contain additional photos. These include an Extension publication from Texas A&M, an article from American Rose magazine, as well as an article from HortScience. Conditions in Kern will affect the spread and development of the disease, so our experience may not be the same as has occurred back east.

If you see such a plant, please note its specific location (address, placement on the property), and contact me at jfkarlik@ucanr.edu. A photo would be helpful.

Please note that damage to rose plants from glyphosate (Roundup™) (photo at right) has a limited resemblance to RRD. However, glyphosate damage does not produce excessive thorniness. Also, rose terminals affected by glyphosate are needle-like and do not appear as a witch's broom.

John Karlik
Environmental Horticulture/Environmental Science

Disclaimer: Discussion of research findings necessitates using trade names. This does not constitute product endorsement, nor does it suggest products not listed would not be suitable for use. Some research results included involve use of chemicals which are currently registered for use, or may involve use which would be considered out of label. These results are reported but are not a recommendation from the University of California for use. Consult the label and use it as the basis of all recommendations.