

Noisy, But That's Not All

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By Stuart Silverstein and Anna Boiko-Weyrauch on September 19, 2017

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QUENTIN LUENINGHEONER/FAIRWARNING

Five years after starting his first job with a landscaping crew in the suburbs of Seattle, Fredi Dubon decided he had enough and called it quits. The work days were long, sometimes 12 hours, but a bigger problem was having to inhale exhaust from his gas-powered leaf blower.

The fumes tended to be harshest in the cool mornings or when he ran his aging machine in the narrow yards of condo buildings. Eventually Dubon, a 28-year-old immigrant from El Salvador, said he was getting migraine headaches “pretty much every day,” a problem that both he and a doctor who examined him attributed to the exhaust belched by the blower.

Yet the headaches that Dubon suffered – until he joined a landscaping company that used electric machines – provide only a whiff of the possible hazards from gasoline-fired lawn and garden equipment.

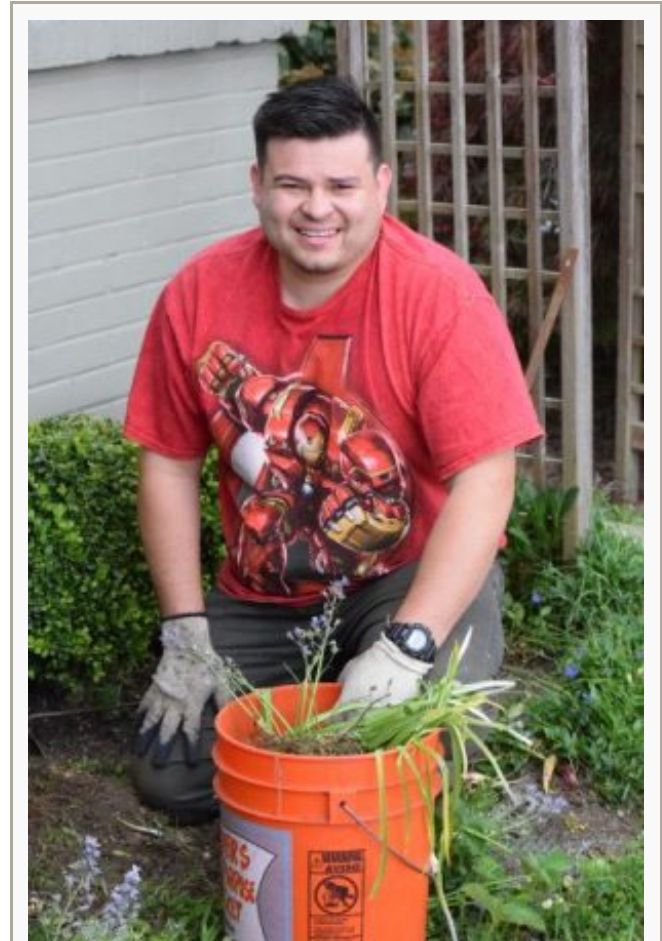
California’s approval of tightened air quality regulations, campaigns for leaf blower bans by local activists around the country, and resolutions passed by the state medical societies of [New York](#) and [Massachusetts](#) highlighting health risks are beginning to draw more attention to the issue. At the same time, landscaping equipment manufacturers once accused of resisting a shift to electric machines, and that still push back against environmental regulations, are offering more of the so-called zero-emissions options.

Scant research exists on the potential health impact of emissions from the millions of gas-powered leaf blowers, lawn mowers, trimmers and related equipment now in use. Yet, despite improvements, these machines still emit toxic contaminants such as carcinogenic benzene as well as surprisingly large amounts of other smog-forming chemicals.

In fact, according to estimates by the U.S. Environmental Protection Agency, emissions of smog-producing substances from mowers, blowers and other small off-road engines last year were 81 percent as high as the amount from standard sedans. In the air pollution-plagued Los Angeles area, the small off-road engines category [is projected to overtake cars](#) as a contributor to smog around 2020.

Perhaps most worrisome, the gas engines release high concentrations of microscopic ultrafine particles, as recently confirmed in [tests commissioned by FairWarning](#). Ultrafine particles are unregulated, but scientists increasingly believe they are a serious danger. That threat is particularly true for landscaping workers, but also a potential concern for other adults and children who are exposed. Ultrafine particles are 0.1 of a micron, or roughly one-thousandth the width of a human hair.

“The basic idea is that the smaller the particle, the deeper it can be inhaled into the lungs, and the more potential it has then to cause health problems” such as lung cancer, [heart disease](#), strokes, asthma and other respiratory ailments, said Jo Kay Ghosh, an epidemiologist and the health effects officer for the South Coast Air Quality Management District, a pollution control agency covering much of smoggy Southern California. Ultrafine particles also can pass through cell membranes and slip into the bloodstream.



Fredri Dubon blamed his daily migraine headaches on fumes from the gas-powered leaf blowers he used in his landscaping work.

Unpublished, preliminary research by California regulators last year underscored such concerns. The California Air Resources Board’s limited testing, which is being followed up with a more formal study, suggested that the equipment operators were exposed to at least 10 times more ultrafine particles than if they were standing beside a busy roadway.

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For workers who earn their living operating such equipment, “This is extremely alarming,” said Michael T. Benjamin, chief of the board’s monitoring and laboratory division, at a hearing last November.

More recent testing conducted by a consulting firm for FairWarning, involving six workers who were monitored while using 16 pieces of gas-powered equipment, detected even more dramatic surges of ultrafine particles. In one instance, ultrafine particle levels around an 11-year-old leaf blower were 50 times higher than at a nearby clogged intersection at rush hour. In the same round of tests, with a 2017 model leaf blower, the ultrafine particle level was more than 40 times higher than at the busy intersection.

Rima Habre, an environmental health expert at the University of Southern California medical school, said landscaping workers are particularly at risk because they commonly put in long days toiling very close to these sources of potentially dangerous emissions. In addition, because the workers physically exert themselves while they perform their jobs, they are likely to breathe harder and inhale more contaminated air deeper into the lungs. “All together, that means they get a much higher exposure and inhaled dose than the rest of us,” Habre said.

Standard, disposable “N95” [masks or respirators](#) available at hardware stores can provide protection against exhaust particles – if they are fitted properly, which isn’t always easy. It takes [more specialized respirators](#) to filter out gases such as benzene. But due to cost, discomfort and lack of information, many workers don’t get any kind of respiratory protection.

The air pollution puts yet another burden on the nation’s roughly 1 million landscaping workers, who frequently are low-income immigrants with few job alternatives. They also often endure intense leaf blower noise, which a [Centers for Disease Control report](#) this year said can cause permanent hearing loss.

Aside from possible hazards to landscaping workers, the gas-powered equipment pollutes the air breathed by

everyone. That factor spurred the California Air Resources Board, a national leader in air quality regulation, last November to approve tighter requirements for mowers, blowers, chainsaws and other small off-road engines, with a broader round of restrictions expected within a few years.

The small off-road engines category is giving the auto a run for its money as a source of emissions that lead to smog, in part because cars burn gasoline much more cleanly than they once did. [In one comparison](#), California officials say the contamination from running a top-selling leaf blower just one hour matches the emissions from driving a 2016 Toyota Camry for 1,100 miles, the distance from Los Angeles to Denver. The pollutants in the leaf blower-versus-car comparisons are oxides of nitrogen and reactive organic gases.

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“You think about how much focus there is on reducing emissions from cars, and rightfully so, but how little we focused on these engines,” said Bill Magavern, policy director for the Coalition for Clean Air, a California-based advocacy group. Magavern called the emissions comparisons “stunning” and added, “It just, to me, shows why we really need to pay a lot more attention to reducing emissions from this sector.”

California first approved emissions regulations on small off-road engines in 1990, and the rules have been expanded and strengthened since then. The federal EPA, in turn, generally has followed California’s lead.

The emissions regulations, though, sometimes have been ineffective. In fact, the tightened testing and enforcement rules unanimously approved by the Air Resources Board last November were prompted by spot checks showing that more than half of the machines failed to meet California air quality standards.



Michael T. Benjamin, a California air quality official, said a preliminary state test found that landscaping workers could be getting “extremely alarming” exposure to ultrafine particles.

The lawn and garden equipment manufacturing industry, which last year had [estimated wholesale sales](#) in the U.S. [approaching \\$11 billion](#), has a track record of fighting hard to fend off regulation. A high-profile battle erupted in 2003 when Briggs & Stratton – which [describes itself](#) as the world’s largest producer of gasoline engines for outdoor power equipment – unsuccessfully tried to thwart a new round of rules adopted later that year in California. The company persuaded Kit Bond, then a U.S. senator from Missouri, to push an amendment intended to strip California and other states of the ability to adopt air quality standards tougher than the federal rules for small off-road engines. Bond said he was trying to save jobs at Briggs & Stratton plants in his state.

California lawmakers resisted, and eventually a compromise was reached leaving California’s authority intact but barring other states from adopting tougher-than-federal standards. And now, given that no one expects the Trump administration to take new steps to reduce air pollution around the country, “you’ve got a situation where even though California can move ahead legally and adopt some standards that pertain to California, the rest of the country is basically shit out of luck,” said Frank O’Donnell, president of the Washington, D.C., nonprofit group, Clean Air Watch.

Both Briggs & Stratton and the Outdoor Power Equipment Institute, which supported the company’s effort and is the industry’s main trade group, declined to be interviewed for this story. But the institute has taken the lead in trying to thwart the latest California rules. It submitted [a 101-page filing](#) loaded with objections to the proposals before they were approved, and then in June fired off another [12-page letter](#) in a late effort to stop the regulations, which are due to take effect in January.

In the June letter, the industry group accused the California agency's staff of a "failure to address the true costs" of the tougher rules. It also asserted that the flaw "will result in the rule being invalidated" by California's Office of Administrative Law "or possibly by a court," suggesting that the industry is prepared to sue California to derail the regulations.

When it comes to leaf blowers, local governments have been an intense regulatory battlefield. A nonprofit group, Quiet Communities Inc. says nearly 140 communities around the country over the years have imposed bans or restrictions that apply to noise from leaf blowers. Their buzzing has riled up many a cozy suburb – but air quality and public health also are at issue.

Even so, leaf blowers remain a hot retail item. More than 4 million are estimated to have been sold in the U.S. last year, despite the community activists and environmentalists who consider the machines needless nuisances. "Some of this equipment, let's face it, is not really all that necessary. We got along fine before we had leaf blowers," said Magavern of the Coalition for Clean Air.

Jamie Banks, a medical economics researcher with graduate degrees from schools including MIT and Dartmouth, founded Quiet Communities four years ago after the noise from landscaping equipment shattered her sense of peace while working from home in the town of Lincoln, Mass., near Walden Pond. "It went on for hours every day," said Banks. "The air would smell like gasoline."

For many homeowners and landscapers, though, leaf blowers are regarded as essential time-saving tools.

Landscaping firm owners assert that the machines enable them to keep customers' yards tidy at a reasonable price. Faith Michaels, a landscaping firm owner in Brookline, Mass., who has been a leader in fighting restrictions on the machines in her community, says leaf blowers also benefit her employees. "If we had all our people raking, we'd have a lot of back injuries," she said.



Greg Knott, vice president of the Outdoor Power Equipment Institute, requesting a delay in new California emissions rules. In June, he sent a letter accusing California officials of a "failure to address the true costs" of the tougher rules.



AIR CHECK

Leaf blowers can make an infernal racket, and environmental officials say that exhaust from blowers and other gas-powered lawn and garden equipment is a surprisingly big source of air pollution.

But are landscaping workers who use the equipment day in and day out exposed to potentially harmful emissions? A 2006 study by the U.S. Environmental Protection Agency raised concerns, but otherwise little research exists. So FairWarning decided to commission some testing of its own.

With the help of a grant from the Fund for Investigative Journalism, FairWarning hired a workplace safety and health consulting firm, Health Science Associates of Los Alamitos, Calif. It carried out testing over three days at sites in the San Fernando Valley area of Los Angeles.

The testing focused mainly on measuring ultrafine particles in the air around gas-powered machines. Although no nationally accepted occupational safety standards exist for ultrafine particles, they are a source of increasing concern among scientists. Due to their small size – about one-thousandth the width of a human hair – they can be breathed deeply into the lungs, where they are thought to raise the risk of such ailments as lung cancer and heart disease.

In all, the testing involved six landscaping workers and 16 pieces of gas-powered equipment from 818 Land Maintenance, a small Chatsworth, Calif., firm, and Gothic Landscape, a Santa Clarita, Calif.,-based company that operates in four states. Four electric machines were provided by the American Green Zone Alliance, a Studio City, Calif.,-based firm that promotes “zero-emission” landscape maintenance.

To detect concentrations of ultrafine particles, HSA’s industrial hygienists used a P-Trak, a machine about the size of a shoebox with an attached wand-like probe. Equipped with their devices, the industrial hygienists strode alongside landscaping workers as they operated leaf blowers, lawn mowers, string trimmers and a chainsaw.

In one instance on Day 1 of testing, ultrafine particle levels around a leaf blower were more than 50 times higher than at a nearby clogged intersection at rush hour. Day 2 involved retesting machines and comparing particle concentrations around the gas-powered equipment to the particle levels around electric equipment. Finally, on Day 3, a somewhat newer batch of machines – model years 2015-2017 – were tested.

The bottom line: Gas-powered machines, with only a couple of exceptions, appeared to generate substantial amounts of ultrafine particles – far more than detected at a busy intersection -- while the electric machines did not.

HSA also did limited testing for benzene, a carcinogen, and

noise. It found that the benzene levels were within occupational regulatory limits. The noise testing provided inconclusive results on whether regulatory limits were exceeded.

– *Stuart Silverstein*

The report commissioned by FairWarning on emissions from leaf blowers and other gas-powered equipment [is available here](#).

Nationally, the leading voice in defending the leaf blower and in trying to swat down pollution and noise concerns is Larry Will, a retired vice president of engineering, and now a paid consultant, for equipment maker Echo Inc. He said he also did some work previously for the Outdoor Power Equipment Institute. Will, who oversaw the development of a quieter leaf blower at Echo before leaving his job as a company executive in 2002, points out on his website, [leafblownoise.com](#), that he has been quoted by such prominent journalism outlets as The New Yorker, The Atlantic and CBS News. He [told CBS on camera in 2011](#) that critics who raise health arguments against leaf blowers were “grasping at straws, if you will, because it’s not true.”

In an interview with FairWarning, Will said: “Has anyone died from a leaf blower? Has anyone even gotten sick from a leaf blower? ... Don’t expect me to tell you that leaf blower emissions is bad, because it isn’t. It’s acceptable to the EPA, the governing body that tells us what it should be.”

As part of his regular routine, Will monitors news from around the country about anti-leaf blower laws, and by his own account has contacted [about 160 local and state government entities](#) to give his side of the story. Although he sometimes describes himself as a “consultant” for those governmental bodies, he acknowledged that he is paid only by Echo.

Critics say he tries to talk communities out of leaf blower bans with misleading statements and half-truths. “There are reasons why the American Lung Association and the EPA have written about this as a source of emissions, and yet he will claim that this is not an issue,” Banks said.

On his “Leaf Blower Facts” web page, Will states that he has “never found any test data or reputable report, which shows that leaf blowers cause any kind of illness. This is confirmed by the California Air Resources Board in [their report to the State Legislature, which was compiled by Dr. Nancy Steele](#).”

In that year 2000 review of research available at the time, Steele did in fact state that “there have been no dose-response studies related to emissions from leaf blowers and we do not know how many people are affected by those emissions.” (Even today, there is no published research specifically on potential risks from leaf blower emissions, and public health authorities have been left to draw their own conclusions from related research.)

Yet Steele also wrote that “potential health effects from exhaust emissions, fugitive dust, and noise range from mild to serious.” Further, she said, “Some toxic compounds in gasoline exhaust, in particular benzene, 1,3-butadiene, acetaldehyde, and formaldehyde, are carcinogens.”

Landscaping workers commonly say they feel the effects of breathing exhaust from gas-powered machines. The issue helped spur Dubon, the Seattle-area worker who complained of headaches from leaf blower fumes, to begin leading job safety workshops last year for Casa Latina, a nonprofit day labor center and advocacy organization.

Some of the workers Dubon meets who use gas-powered equipment, he said, tell him “they feel dizzy or nauseous” after operating the machines. A worker who was part of a group Dubon met with in April, Alexander Blanco, related how exhaust streaming from his mower after a long day of cutting lawns could make his eyes water and his body feel tired.

Yet landscaping workers often are resigned to the fumes as well as to the noise and vibrations from their gas-

powered machines. “You know you need to earn money and you have to work,” said Sergio Maldonado, a 35-year-old Guatemalan immigrant who has done landscaping in Miami for 18 years.

He added: “If you don’t do it, and you’re working for another person, they’ll fire you, and then who is going to bring home food?”

Maldonado now is in business for himself. But in the years he spent working for other landscape maintenance firms, none of his employers ever provided safety gear like masks, glasses or gloves – and he couldn’t afford to get them himself. “You start buying those things, plus breakfast, snack, lunch and dinner and that kind of stuff, the money you earn wouldn’t be enough for you.”

Besides, Maldonado said, doing something like wearing a mask would have provoked his bosses and others on his crew to make fun of him. Now, he simply wears a rag over his mouth to provide relief from the fumes. Maldonado also avoids wearing earmuffs for noise protection, because they distort his sense of what’s going on around him.

On the other hand, Richard Valenzuela, a lead grounds maintenance worker at California State University, Los Angeles, says he usually uses a mask to avoid inhaling dust, and that some of his younger co-workers increasingly are doing the same. Valenzuela said he doesn’t always notice the exhaust from his gas-powered machines while he is focused on his work. But, he said, “At the end of the day, you go home and you can smell it on your clothes, on your T-shirt. I’ve got to put my clothes outside every day when I get home.” Valenzuela said he is thankful that the university has begun phasing out the gas machines and is switching to electric equipment. “It’s really going to be a benefit for us,” he said. “That stuff goes straight to your lungs.”

Electric lawn and garden machines – both corded models and battery-powered gear – are gaining acceptance around the country. According to the market research firm The Freedonia Group, electric machines accounted for 47 percent of manufacturers’ \$438 million in U.S. sales last year of leaf blowers.

Although most of the electric equipment is being bought by homeowners, institutions such as Cal State LA and commercial landscaping companies are a big part of the market, too. The nation’s largest commercial landscaping company, BrightView, this year [began equipping some of its crews](#) with electric mowers, blowers, trimmers and edgers as part of a pilot program. The company said the move was a response to “growing trends and customer requests’ for zero-emission, low-noise equipment.”

Battery-powered machines are narrowing the gap in performance with gas-powered devices, and they offer flexibility that corded electric equipment can’t match. But short battery life – they rarely run more than an hour – and the time it takes to recharge continue to slow acceptance among professional landscaping firms. “Time is money for them,” said Gerry Barnaby, a spokesman for Ego, a leading brand of battery-powered equipment. A major shift to electric equipment by landscapers, he said, likely will require further improvements in battery technology. He explained: “They can’t necessarily plug in everywhere they go.”

That, however, hasn’t stopped environmental officials and activists from trying to speed the switchover to electric equipment. In such states as California, Utah and Pennsylvania, local agencies have offered [exchange programs](#) that give equipment owners financial incentives to turn in their gas-powered machines and replace them with



Richard Valenzuela, a university grounds worker, is thankful his campus is phasing out gas-powered machines. The exhaust, he said, “goes straight to your lungs.” (Photo by J. Emilio Flores, California State University, Los Angeles.)

electric gear. “That’s really the future,” said Diane Takvorian, who sits on the California Air Resources Board, referring to electric machines.

In the meantime, she is concerned about the “huge air quality issues” posed by the gas-powered machines. Takvorian, who is also the executive director of an advocacy group called the [Environmental Health Coalition](#), is particularly focused on the potential harm to landscaping workers. “These guys are out there every day, all day,” she said.

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