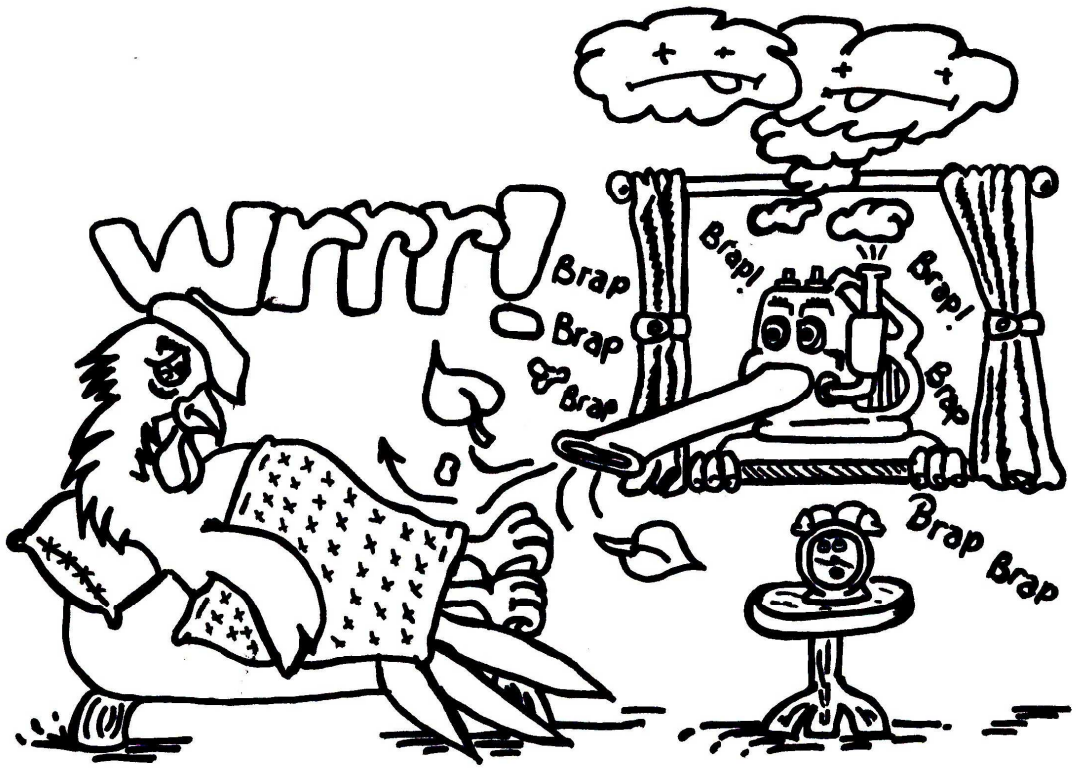
Leaf Blower Hazards

In San Luis Obispo County



LEAF BLOWER HAZARDS
IN SAN LUIS OBISPO COUNTY

SUMMARY

The use of two-cycle gasoline engine leaf blowers in the cities and unincorporated areas of San Luis Obispo County presents a health hazard to all citizens. The hazards are four-fold:

- All gasoline powered leaf blowers create emissions and toxic exhaust fumes. However, two-cycle leaf blowers pollute more and are the loudest. Exhaust pollution from a typical gas powered leaf blower over one hour is equal to one car driven 200 miles in a confined area.

- The high-velocity air jets used in blowing leaves move more than just leaves. The particulate matter (PM) swept into the air includes many unwanted and toxic elements. Various pollutants include dust, pesticides, chemicals, fertilizers, fungi, street dirt and fecal matter. Approximately five pounds of PM per leaf blower per hour are blown into the air and can take hours or even days to settle.

- Two-cycle leaf blowers generate unhealthy high noise levels. Two-cycle leaf blowers generate a decibel level that can cause permanent hearing loss to the operator and an annoyance to anyone nearby.

- Unaware citizens, including the most vulnerable in our county such as the young, homebound and seniors frequently must endure the localized air and noise pollution of two-cycle leaf blowers.

Considering the evidence, the Grand Jury concluded the health hazards residents are exposed to from two-cycle leaf blowers outweigh the possible benefit they provide. The Grand Jury recommends that the San Luis Obispo County Board of Supervisors and all incorporated cities initiate a gradual phase-out of two-cycle gasoline powered leaf blowers for landscape and cleanup operations.

INTRODUCTION AND PURPOSE

The purpose of this report was to assess the health hazards caused by leaf blowers within San Luis Obispo County. The Grand Jury assessed air and noise pollution caused by leaf blowers in public, commercial and residential uses. Three types of leaf blowers were reviewed: two cycle, four cycle and electric. This report will summarize the findings of this assessment, along with recommendations for actions to reduce health hazards presented by leaf blowers. If the recommendations are implemented, the quality of life for the citizens of San Luis Obispo County could improve without causing undue hardship.

METHOD/PROCEDURE

Interviews were conducted with staff of the San Luis Obispo County Air Pollution Control District (APCD), the San Luis Obispo County Department of Planning and Building and its Code Enforcement Division. The Grand Jury reviewed written materials from various sources, including:

- U.S. Environmental Protection Agency (EPA)
- California Air Resources Board (CARB)
- California State Assembly Bill 32: Global Warming Solutions Act of 2006
- Municipal codes within San Luis Obispo County

- California Landscape Contractors Association
- Consumer Reports Magazine and various other news sources
- American Speech-Language-Hearing Association

NARRATIVE

Leaf blowers were introduced to the United States in the 1970s. Drought conditions in California precipitated acceptance of the blowers as a water saving clean-up option in lawn and garden maintenance. Soon after leaf blowers were introduced, complaints regarding noise and air pollution began, leading to restrictive ordinances or complete bans. There are three types of portable leaf blowers in common use: gas powered with either a two or four-cycle engine and electric powered. All have practical applications, as well as contributing to environmental hazards in varying degrees.

Description of Hazards

Exhaust Emissions: Exhaust emissions are those emissions generated from the incomplete combustion of fuel in an engine. Small, two-cycle gasoline engines have traditionally powered most leaf blowers. They are inexpensive, lightweight, operate in any position and generate a relatively large amount of power. A major disadvantage, however, is the high exhaust emissions due to the required mixing of fuel and oil that are inefficiently burned in the combustion chamber leading to as much as 30% of the fuel/oil mixture being exhausted unburned. According to the U.S. Environmental Protection Agency, a typical leaf blower generates as much emission in one hour as an automobile does while traveling over 200 miles, with the major difference being the leaf blower emits the pollution in a much smaller radius. The resulting major pollutants are oil-based particulates, hydrocarbons and carbon monoxide. Some of the hydrocarbons in fuel and combustion by-products are toxic air contaminants, including benzene, 1,3-butadiene, acetaldehyde and formaldehyde.

Four-cycle leaf blowers emit significantly lower emissions than two-cycle leaf blowers, with lower levels of hydrocarbons and particulate matter. Electric blowers have the advantage of not requiring fuel or oil, thus, there are no exhaust emissions.

Fugitive Dust Emissions: Besides the intended purpose of moving leaves, grass and other garden debris, blowers cause sidewalk and roadway dust to become airborne (fugitive dust). Varying by make and model, leaf blowers move air at 150 to 280 miles per hour. As a comparison, a Category 5 hurricane is defined as wind speed of 156+ miles per hour. Fugitive dust may contain pollen, animal fecal matter, herbicide and pesticide residues, fungi, spores and street dirt containing tire rubber, heavy metals and organic and elemental carbon. Especially harmful are the particulate matter (PM) in fugitive dust that are small enough to be inhaled (defined as particles smaller than 10 micrometers). PM from fugitive dust cloud emissions can linger in the air from minutes to as long as a week, depending on PM size and local conditions.

Noise Emissions: Noise is the general term for sound that is perceived as disagreeable and unwanted. High intensity, high frequency sounds are the most damaging to the ear and usually identified as the most annoying. The noise emitted from leaf blowers contains a significant amount of high intensity and high frequency emissions. In a quiet neighborhood, there are no natural sources of sound at these same frequencies. Therefore, the sounds are not easily masked and are more noticeable, contributing to a high level of annoyance perceived by bystanders.

Noise levels from leaf blowers are measured in decibels (dBA) and usually are manufacturer-reported levels that represent exposure of a bystander at 50 feet from the blower. Sound levels are estimated to range from 62 to 75 dBA. The difference in 62 versus 75 dBA is roughly 100 times the sound intensity and is perceived by a bystander as significantly louder. The dBA for the operator of a two-cycle blower is estimated to range from 87 to 101 dBA. Sounds louder than 80 dBA are considered potentially dangerous. Both the amount of noise and the length of time of exposure determine the amount of potential damage to hearing. Hair cells of the inner ear and the hearing nerves can be permanently damaged by an intense brief impulse, like an explosion, or by continuous or repeated exposure to noise.

The regulation of leaf blowers in California cities and counties typically is based on noise emissions standards and falls into the categories of time of the day, days of the week and dBA limits. Under current San Luis Obispo County code, noise from leaf blowers is not permitted to exceed 70 dBA between the hours of 7 a.m. to 10 p.m., and 65 dBA between the hours of 10 p.m. and 7 a.m. The City of San Luis Obispo has more stringent restrictions including the ban of gasoline powered blowers anytime on Sundays, and limiting the use of any power blower on other days of the week to between the hours of 8 a.m. and 6 p.m. in residential zones, and 7 a.m. and 6 p.m. in non-residential zones.

An interview conducted with a San Luis Obispo County Code Enforcement official revealed that current noise ordinances are not practical to enforce, and in fact, are never enforced with regards to leaf blowers. For code enforcement to issue a violation of current noise codes, the officer would need to actually witness a violation and be able to verify a blower exceeded dBA limits. However, use of a specific type of blower that is banned would be clearly observable, and therefore, more easily enforceable.

Health Effects

Particulate Matter is inhalable and able to deposit on the lungs' airway surfaces. Smaller particles, 2.5 micrometers or less, are able to penetrate deep into lung tissue. Exposure to PM has been linked to higher hospital admissions and respiratory ailments.

Carbon monoxide (CO) is a product of incomplete combustion of carbon containing fuels. CO in the air can be absorbed from the lungs into the bloodstream, and in significant levels can reduce oxygen to body tissues. Risk groups for ambient CO include the elderly, pregnant women, infants, those with anemia, respiratory diseases and heart disease with exercise-induced angina.

Benzene from burned and unburned fuel is a known carcinogen and depresses the central nervous system. Formaldehyde, acetaldehyde and 1,3-butadiene also have been identified as probable carcinogens and acute exposure may lead to eye, skin and respiratory tract irritation.

Leaf blowers emit substantial hydrocarbons, primarily from unburned fuel, that can react with nitrogen dioxide to form ozone. Ozone is a known irritant, with exposures of as little as one hour causing constriction of airways, coughing, shortness of breath and worsening of respiratory diseases such as emphysema, bronchitis and asthma. Over time, permanent damage and decreased lung capacity from repeated exposure can occur.

There is a direct relationship between repeated exposure to excessive noise and hearing loss. Noise induced stimulation of the autonomic nervous system has been linked to high blood pressure, headaches and cardiovascular disease. Noise acts as a biological stressor that can trigger a "fight or flight" response, causing stress and anxiety. Excessive noise also interferes with communication, disrupts sleep, impairs concentration and generally causes community annoyance.

Alternatives

Rakes and brooms are quiet alternatives to leaf blowers and consume no resources. They emit minimal dust and debris into the air and do not release pollutants from exhaust emissions. Rakes and brooms are efficient and almost as fast as power blowers. After banning the use of leaf blowers in 1990, the City of Claremont, California calculated that the increase in workload using rakes and brooms was only 6 percent more than with the use of blowers in the maintenance of city property. This calculation did not include the time for maintenance and fuel/oil mixing for the blowers. Other cities found similar results.

In situations where a power blower is absolutely necessary, testing has shown that electric models, while generating less noise, have out-performed gasoline fueled competitors with comparable power. The quietest and least polluting type of leaf blower is electric and most owners and reviewers say an electric leaf blower will suit homeowners very well. Electric blowers are also easier to maintain. While exhaust emissions are eliminated, fugitive dust and PM pollution are still an issue.

In cases where hand raking or an electric blower is not feasible, newer four-cycle gasoline fueled blowers are preferable due to their reduced exhaust emissions and noise. Experts recommend reserving use of gasoline-powered blowers to work areas farther than a 150-foot extension cord can reach, or where a power cord is not practical.

Compliance in Cities Banning Leaf Blowers

Over 300 cities nationwide have banned or restricted leaf blowers including more than 100 municipalities in California. Examples include:

1. The City of Santa Barbara banned all gasoline powered leaf blowers in 1997. Electric powered leaf blowers are allowed, but may not be used within 250 feet of a residential zone and must be certified to meet a dBA level of no more than 65. The parks department incurred a one-time cost of $90,000 (out of a budget of $4 million) to replace equipment and has seen no additional impact on city cleanup in regards to time or cost.
2. The City of Carmel banned leaf blowers in 1974, becoming the first city in the nation to impose leaf blower restrictions.
3. The City of Los Angeles (population 3.6 million) banned leaf blowers in 1998.

Air Quality Legislation

California State Assembly Bill 32 (AB32), the Global Warming Solutions Act of 2006, is a statewide effort enacted to reduce environmental emissions leading to greenhouse gases. AB32 requires the California Air Quality Board (CARB) to adopt regulations by 2011 that will achieve technologically feasible and cost-effective reductions in greenhouse gases. At a local level, the San Luis Obispo County Air Pollution Control District (APCD) is the primary agency responsible for achieving the clean air standards established by the CARB. The APCD is actively developing a multi-pollutant clean air plan which is scheduled to be presented to the San Luis Obispo County Board of Supervisors in December 2010. Currently, the APCD does not have jurisdiction over mobile consumer devices such as leaf blowers, but can make recommendations to the Board of Supervisors and incorporated cities. Any change to leaf blower regulations within San Luis Obispo County would be the task of the County Board of Supervisors and city councils.

FINDINGS

It is the finding of the Grand Jury that leaf blowers can cause preventable health hazards to the citizens of San Luis Obispo County.

1. Gasoline-powered leaf blowers, particularly two-cycle models, create exhaust emissions containing carbon monoxide, hydrocarbons and other harmful particulate matter. The resulting pollution from one leaf blower operated for one hour is approximately equivalent to one car being driven 200 miles.
2. All leaf blowers create fugitive dust drifts containing harmful chemicals, fungi, fecal matter and harmful particulate matter that can linger in the air for hours.
3. Leaf blowers, two-cycle models being the loudest, generate high intensity and high frequency noise that can lead to operator hearing loss, as well as multiple harmful physiological and psychological responses to the operator or bystanders. Current county noise ordinances are limited to decibel level violations that are unenforceable in practice. A specific ban on two-cycle leaf blowers would be an effective and enforceable ordinance.
4. California Assembly Bill 32 of 2006 mandates reduction of harmful greenhouse emissions. San Luis Obispo County must adopt measures to meet emission reduction requirements.
5. It has been demonstrated manual rake or broom cleanup is nearly as time efficient and effective as leaf blowers, without causing harmful air or noise hazards. When a leaf blower is necessary, an electric model is the preferred option due to no exhaust emissions. Four-cycle gasoline powered leaf blowers should be limited to areas of greater than 150 feet from an electric power source, or when a power source is not available.

RECOMMENDATIONS

Based on these findings, the Grand Jury recommends that:

1. The San Luis Obispo County Board of Supervisors pass an ordinance calling for a gradual two year phase-out of all two-cycle gasoline powered leaf blowers within San Luis Obispo County.
2. The San Luis Obispo County Board of Supervisors adopt the same guidelines currently in effect within the City of San Luis Obispo for the restriction of days and hours of operation allowed for leaf blower use.
3. Each incorporated city within San Luis Obispo County adopt a parallel ordinance to ensure consistency throughout the county.

REQUIRED RESPONSES

The San Luis Obispo Board of Supervisors is required to respond to Recommendations 1 and 2. The responses shall be submitted to the Presiding Judge of the San Luis Obispo Superior Court by **July 29, 2010**. Please provide a copy of all responses to the Grand Jury as well.

The Atascadero City Council is required to respond to Recommendation 3. The response shall be submitted to the Presiding Judge of the San Luis Obispo Superior Court by **July 29, 2010**. Please provide a copy of all responses to the Grand Jury as well.

The Arroyo Grande City Council is required to respond to Recommendation 3. The response shall be submitted to the Presiding Judge of the San Luis Obispo Superior Court by **July 29, 2010**. Please provide a copy of all responses to the Grand Jury as well.

The Grover Beach City Council is required to respond to Recommendation 3. The response shall be submitted to the Presiding Judge of the San Luis Obispo Superior Court by **July 29, 2010**. Please provide a copy of all responses to the Grand Jury as well.

The Morro Bay City Council is required to respond to Recommendation 3. The response shall be submitted to the Presiding Judge of the San Luis Obispo Superior court by **July 29, 2010**. Please provide a copy of all responses to the Grand Jury as well.

The Paso Robles City Council is required to respond to Recommendation 3. The response shall be submitted to the Presiding Judge of the San Luis Obispo Superior Court by **July 29, 2010**. Please provide a copy of all responses to the Grand Jury as well.

The Pismo Beach City Council is required to respond to Recommendation 3. The response shall be submitted to the Presiding Judge of the San Luis Obispo Superior Court by **July 29, 2010**. Please provide a copy of all responses to the Grand Jury as well.

The San Luis Obispo City Council is required to respond to Recommendation 3. The response shall be submitted to the Presiding Judge of the San Luis Obispo Superior Court by **July 29, 2010**. Please provide a copy of all responses to the Grand Jury as well.

The mailing addresses for delivery are:

Presiding Judge	Grand Jury
Presiding Judge Charles S. Crandall Superior Court of California 1050 Monterey Street San Luis Obispo, CA 93408	San Luis Obispo County Grand Jury P.O. Box 4910 San Luis Obispo, CA 93402

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