Indiana Yard and Garden – Purdue Consumer Horticulture

Please Don't Burn Your Leaves

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The recent Arctic blast that visited our area made for a rather dramatic leaf fall in many neighborhoods. With large quantities of leaves blowing around their yards, some people may be tempted to resort to the old-fashioned and effective method of burning.

However, in addition to being illegal in many areas, leaf burning leads to air pollution and is a health and fire hazard. The smoke from burning leaves contains a number of toxic and/or irritating particles and gases. The tiny particles contained in smoke from burning leaves can accumulate in the lungs and stay there for years. These particles can increase the risk of respiratory infection, as well as reduce the amount of air reaching the lungs. For those who already suffer from asthma and other breathing disorders, leaf burning can be extremely hazardous.

Moist leaves, which tend to burn slowly, give off more smoke than do dry leaves. These moist leaves are more likely to also give off chemicals called hydrocarbons, which irritate the eyes, nose, throat and lungs. Some of these hydrocarbons are known to be carcinogenic.

Carbon monoxide is an invisible gas that results from incomplete burning, such as with smoldering leaf piles. After inhaling carbon monoxide gas, it is absorbed into the blood, where it reduces the amount of oxygen that the red blood cells can carry. Children, seniors, smokers and people suffering from chronic lung and heart disease are more susceptible than healthy adults to carbon monoxide effects.

I hope these facts have convinced you to not burn your leaves, but what are the alternatives? Those of us lucky enough to have municipal pickup of leaves for composting can simply rake the leaves to the curb, or bag them if appropriate. But what are the rest of us supposed to do with all these leaves?

You could compost those leaves yourself. Dry leaves alone will break down slowly over time, but you can speed that process by mixing the leaves with green plant materials, such as grass clippings, garden discards and produce scraps. Or you could add a source of nitrogen, such as livestock manure or commercial fertilizer. Mix (turn) the pile occasionally to keep a good supply of air in the compost. A good-sized compost pile should be a minimum of 3 cubic feet. The compost will be ready to use as a soil conditioner in several weeks to several months, depending on size and management techniques.

Shredded leaves also can be used as a mulch around garden and landscape plants. Mulches provide many benefits, including weed suppression, moisture conservation and moderation of soil temperature. Leaves can be applied to dormant plants in winter to prevent young plants from heaving out of the ground. Leaf mulch can help keep soil cooler in summer. No more than a 2- to 3-inch layer of leaves should be used around actively growing plants. Chopping or shredding the leaves first will help prevent them from matting down and preventing air from reaching roots.

Directly applying the leaves to a garden or unused area of soil is another option. Try to spread the leaves over as large an area as possible, then till or plow them under. Chopping or shredding the leaves first will help them to break down faster.

My personal favorite option is to simply shred the leaves through my lawn mower until the pieces are small enough to just leave them right there on the lawn! Dry leaves are much easier to handle through the mower than moist ones. If possible, remove the bagger so all of the leaves are deposited right back onto the lawn as they shred.

SHARE THIS ARTICLE

ENVIRONMENTAL AND HEALTH IMPACTS OF OPEN BURNING

All open burning poses risks to the environment and public health. Smoke pollutes the air we breathe. Ash pollutes our soil, groundwater, lakes, rivers and streams. Burning anything in the outdoors can cause a wildfire. Burning only approved materials and following state regulations can minimize the potential for these harmful effects.

Smoke Wildfire Ash Additional resources

ENVIRONMENTAL IMPACTS OF SMOKE

Burning prohibited materials, such as garbage, plastic and painted or treated wood, is harmful to the environment because these materials release toxic chemicals that pollute our air. Polluted air can be inhaled by humans and animals, and deposited in the soil and surface water and on plants.

Residue from burning contaminates the soil and groundwater and can enter the human food chain through crops and livestock. In addition, certain chemicals released by burning can accumulate in the fats of animals and then in humans as we consume meat, fish and dairy products.

Smoke and soot can travel long distances. Odors can be bothersome to people. Both odors and smoke residue can enter houses or can impact anything outside of houses, like cars or hanging laundry. The gases released by open burning can also corrode metal siding and damage paint on buildings.

IMPACTS OF BURNING PLASTIC

Some of the most dangerous chemicals created and released during burning are those from burning plastics, such as dioxins, which are byproducts formed when chlorine-containing products are burned. Dioxins tend to adhere to the waxy surface of leaves and enter the food chain in this way. Even if certain types of plastic (such as polyethylene or polypropylene) do not contain chlorine, other materials attached to or burned with the plastic may be a chlorine source.

Unburned portions of the plastic become litter on the ground and in lakes and rivers. As it disintegrates, animals may eat the plastic and get sick. Larger pieces of plastic can become a breeding ground for diseases, such as by trapping water that provides habitat for mosquitoes.

HEALTH IMPACTS OF SMOKE

IMPACTS OF SMOKE FROM BURNING CLEAN WOOD AND LEAVES

When household waste, like wood and leaves, are burned, they produce smoke, which contains vapors and particulate matter (solid and liquid droplets suspended in the air). Air pollution from smoke can impact human health.

People exposed to these air pollutants can experience eye and nose irritation, difficulty breathing, coughing and headaches. People with heart disease, asthma, emphysema or other respiratory diseases are especially sensitive to air pollutants. Other health problems aggravated by burning include lung infections, pneumonia, bronchiolitis and allergies.

IMPACTS OF SMOKE FROM BURNING TRASH AND PLASTIC

Burning trash can cause long-term health problems. The toxic chemicals released during burning include nitrogen oxides, sulfur dioxide, volatile organic chemicals (VOCs) and polycyclic organic matter (POMs). Burning plastic and treated wood also releases heavy metals and toxic chemicals, such as dioxin.

Other chemicals released while burning plastic include benzo(a)pyrene (BAP) and polyaromatic hydrocarbons (PAHs), which have both been shown to cause cancer. If agricultural bags or containers are contaminated with pesticides or other harmful substances, those will also be released into the air.

ENVIRONMENTAL IMPACTS OF WILDFIRE

Debris burning is the number one cause of wildfires in Wisconsin and accounts for thousands of acres of forested land unintentionally burned, and hundreds of structures threatened every year. Unplanned fires pose a serious threat to public safety, property and our natural resources.

Experiencing a wildfire on your property can be devastating. Wildfire damage can be visually disturbing and physically disruptive. The environmental impacts are often not over after the flames are put out. Tree mortality, invasive plants, erosion and road instability are just some of the dangers landowners face after a wildfire.

HEALTH IMPACTS OF WILDFIRE

The unfortunate reality is that some fires can threaten or take lives. It is possible to sustain serious burn injuries, and in some cases even die, when attempting to suppress an escaped fire. However, the majority of fatalities are indirectly related to the fire (e.g., cardiac arrest due to excessive smoke inhalation, or from the physical or emotional trauma of trying to extinguish the fire).

If a fire escapes your control, never try to suppress the fire yourself. Dial 911 immediately. Uncontrolled wildfires can be dangerous for both those responsible for or immediately impacted by the fire, as well as emergency responders, who are forced to engage in high-risk suppression efforts that may compromise their health and safety.

ENVIRONMENTAL IMPACTS OF ASH

Any fire will create ash waste. While wood ash contains some nutrients required by plants for healthy growth, ash is harmful for our lakes, ponds and rivers. Ash contains phosphorous, potassium and trace amounts of micro-nutrients, such as iron, manganese, boron, copper and zinc, all of which can disrupt the delicate ecosystems of water bodies. For example, phosphorus is a powerful growth agent that stimulates algae growth in water bodies. As important as some algae is to the natural food chain, too much algae can result in the formation of scum, foul odors, low oxygen in the water and offensive views.

When burning debris, like brush, leaves, tree limbs or clean scrap wood, avoid burning near a waterway shoreline. Burning along a shoreline kills vegetation and changes the soil structure, with the end result being more soil erosion into the lake.

HEALTH IMPACTS OF ASH

Ash can impact human health through the leaching of heavy metals and other potentially toxic compounds that can end up in streams, lakes and rivers, or in drinking water supplies and our food chain. This is especially true if the materials being burned include anything besides dry, combustible rubbish, yard waste and unpainted and untreated wood. Disposal of ash waste in a licensed landfill can avoid these problems.

ADDITIONAL RESOURCES

The following resources contain additional information about health and environmental impacts and effects of open burning.

- DNR's Don't Burn Agricultural Plastics (WA-1592) [PDF]
- Wisconsin Department of Health Service's Trash and Wood Burning [exit DNR]
- U.S. EPA's Wood Smoke and Your Health [exit DNR]
- U.S. EPA's Dioxins Produced by Backyard Burning [exit DNR]
- American Chemical Society's Backyard Burning Identified as Potential Major Source of Dioxins [exit DNR]

AMERICAN LUNG ASSOCIATION®
of Iowa

Bag 'Em--
Don't Burn 'Em

Leaf Burning:
Effects &
Alternatives

When You Can't Breathe,
Nothing Else Matters®

How to Stop Leaf Burning in Your Community

Some people feel that autumn just wouldn't be the same without the smell of burning leaves. In Iowa communities where leaf burning is still allowed, those with some form of lung disease are forced to head inside to escape the irritation caused by the smoke.

By requesting this information you have taken an important step toward initiating and implementing a ban against open leaf burning in your community.

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When You Can't Breathe, Nothing Else Matters

AMERICAN LUNG ASSOCIATION® of Iowa

This booklet was developed by the American Lung Association of Iowa,
5601 Douglas Ave., Des Moines, IA 50310
(515) 278-5864 * 1-800-LUNG-USA

Iowans at Risk From Air Pollution

Approximately one in every six people is susceptible to the irritating effects of smoke from burning leaves. They include:

- Children under age 10
  - 397,598 Iowa children are under the age of 10 (1992)
- People over age 65
  - 433,114 Iowans are over age 65 (1990)
- Pregnant women
- People with asthma
  - 105,209 adults and 54,058 children in Iowa suffer from asthma (1999)

- People with chronic respiratory diseases
  - 23,625 Iowans suffer from emphysema (1999)
  - 159,008 Iowans suffer from chronic bronchitis (1999)
- Smokers
  - 23% of Iowa's adult population smokes
- People with heart disease
  - One in six men and one in seven women in Iowa has heart disease (source: American Heart Association)
- People with allergies

Statistics on Iowans at risk in your county are available from the American Lung Association

Effects of Leaf Burning

- The continued allowance of open burning leaves in Iowa communities poses many threats to Iowans: economically, medically and emotionally. Effects of leaf burning include:
- Increased hospitalizations for respiratory illnesses.
- Increased costs for trips to the doctor and medicatios for sensitive people.
- Increased mortality.
- Decreased visibility from intense leaf burning which increases the potential for auto accidents and death.
- Costs related to out-of-control fires such as personal injuries, property damage and cost for the fire department.
- Personal injury and increased potential for injury to children.
- Airborne particles can aggravate the symptoms of those with respiratory problems.
- Those with chronic problems such as allergies and asthma are affected.
- 85% of the particles from leaf smoke are inhaled deep in the lungs which can cause adverse physical or chemical effects.
- Serious forest and grass fires may result from our-of-control leaf fires.
- The smoke from burning leaves affects more than just the yard or neighborhood where the burning occurs.
- Those experiencing respiratory problems have decreased mobility and cannot enjoy the fall season.
- Damage to streets can occur from the piles of burning leaves.
- Taking account the results of burning leaves such as illness, decreased strength and a shortened life span, it must be realized that in the long run these things cannot be measured in a dollar amount.

The Human Respiratory System

The tracheobronchial region of the human lungs is made up of both large and small airways. If particles are deposited in the lungs over a period of time in sufficient quantity, it can lead to disease.

The largest particles that are inhaled will be removed by the sinus passages.

The medium particles are usually carried out by the cilia (hairlike projections whose constant motion carries foreign material out of the lungs) and mucous in that portion of the lungs.

The smaller particles are able to go directly into the bloodstream.

Any excess material will build up and interfere with the passage of air through the lungs and will eventually lead to disease.

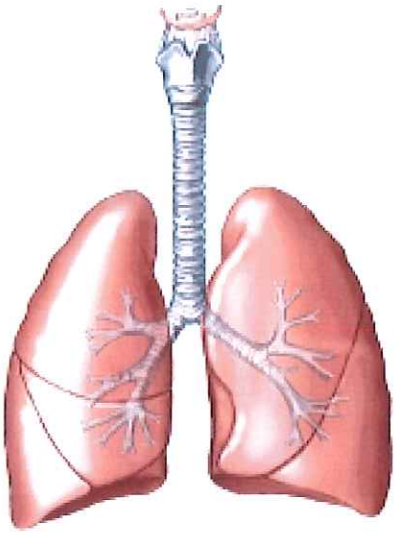
Particles less than 1 micron in size can reach the deep regions of the lungs.

Human Respiratory System
Filtering:

The nose - 7 microns and above

Secondary Bronchi - 2.0 to 3.3 microns

Alveoli - Back up filter, submicron



Trachea & Primary Bronchi - 3.3 to 7.0 microns

Terminal Bronchi - 1.1 to 2.0 microns

85% of the particles from burning leaves travel deeply into the lungs, placing an unnecessary burden on the respiratory system.

Leaf Smoke in The Lungs

Leaf burning gives off major pollutants in the form of particulates, hydrocarbons and carbon monoxide. In addition to the chemical pollutants released, mold spores are distributed in the plume of the fire. These spores may affect people with allergies.

Particulates - Make up the majority of the leaf smoke. Particulates that are small in size reach the pulmonary region, the deepest part of the lungs. It is in the pulmonary region where the alveoli facilitates gas exchange and oxygen is supplied to the bloodstream. Particles that are small enough may be absorbed directly into the bloodstream. These particulates can be toxic. The toxic chemicals that adhere to the particles can cause the greatest health threat.

High Risk Groups For Particulates

- Those with cardiovascular problems
- Asthmatics
- Children 0-6 years
- Some people with bronchitis and emphysema

Hydrocarbons - The unburned chemicals in combustion. Leaf smoke contains seven hydrocarbons known to cause cancer. Eighty-five percent (85%) of the hydrocarbons given off by leaf smoke are small enough to reach the deepest part of the lungs and eventually are absorbed into the bloodstream.

High Risk Groups For Hydrocarbons

- Those with cardiopulmonary problems
- Those with cardiovascular problems
- Tobacco smokers

Carbon Monoxide - Combines with hemoglobin in the blood and reduces the blood's oxygen carrying capacity. Relatively low levels of carbon monoxide can cause dizziness, headaches and fatigue. Most of the carbon monoxide inhaled will be absorbed into the bloodstream.

High Risk Groups For Carbon Monoxide

- Those with cerebrovascular problems
- Those with cardiovascular disease
- Those with anemia
- Those with chronic lung diseases
- Unborn fetuses
- Newborn infants and children
- Tobacco smokers
- Post coronary joggers
- The elderly

On average, 1 ton of leaves will produce 38 pounds of fine particulate matter, 26 pounds of hydrocarbons, and 112 pounds of carbon monoxide.

Tips for Banning Leaf Burning

- Educate yourself first. Get all the information you can on leaf burning. Find out such things as cost effectiveness, health effects and alternative methods for disposing of the leaves within your community.
- Generate community support for banning leaf burning before presenting the issue to the city council. Find council members or supervisors who will endorse your efforts. Call council members individually to see if they would be in favor of a ban.
- Involve community or activist groups for support such as women's groups, local organizations or a Sierra Club that are in favor of a ban and will support your efforts.
- Invite people in the community to sign a petition supporting a ban on leaf burning.
- Research alternative methods such as composting or mulching.
- Ask the health department or the American Lung Association to speak about the harmful effects of leaf burning. This will add credibility to the issue in your community.
- Obtain accurate information about hospital costs, insurance costs and fire damage costs related to leaf burning.
- Talk to the local fire chief and find out about the number of calls for out-of-control fires due to the burning of leaves.
- Develop a public information campaign to encourage alternative disposal methods for the leaves.
- Find out if there is funding available to monitor the local air quality during the leaf burning season.
- Every community will be different in regard to how bans are made effective.
- Find out how to get on the agenda at the next city council meeting.
- If a complete ban will not be put into effect, would the city council consider a compromise such as a partial ban?

Remember: There is power in numbers!!
Get as much support behind you as possible!!

Alternatives to Burning Leaves

- **Mulching**
  - Adds vital nutrients to the soil
  - Prevents wind and water erosion

Shred leaves while mowing and leave on your lawn. Most lawn mowers now come with a detachable mulching blade, or you can purchase one for you mower at a minimal cost.

- **Use leaf mulch around shrubs and garden plants**
  - Discourages weeds
  - Reduces moisture loss
  - Helps control temperature
  - Provides a neat, finished appearance

- **Home composting of leaves for use as a fertilizer and soil conditioner**
  - A properly managed compost pile emits no odors
  - Adds vital organic matter to build up soil and retain more moisture

How to make a leaf compost pile

1. Select an out-of-the-way area that is accessible to water.
2. Make a 2-foot deep pit or enclose the compost pile in fencing or other framework.
3. Place leaves in loose layers, alternating with soil and other vegetative waste.
4. Leaves will decompose faster if a high nitrogen fertilizer is added to each layer.
5. Keep moist
6. Cover with straw, tarp or plastic to retain heat.
7. Keep well aerated by frequent turning of the pile after a few weeks to ensure all parts are thoroughly mixed.

Advantages to Recycling Your Leaves

- Save money in costs of peat and fertilizer
- Reduce the city's waste collection load at less cost to the tax payer.
- Reduce the danger of leaf fires.
- Reduces the city's air pollution problem as caused by leaf burning.
- Eliminate the waste of a material that could be of benefit to you.

- **Bag your leaves for collection**

Examples of Leaf Burning Ordinances

Ordinance No. 91-3489

AN ORDINANCE TO AMEND CHAPTER 24, MISCELLANEOUS PROVISIONS, TO PROHIBIT OPEN BURNING IN IOWA CITY.

WHEREAS, open burning of garden waste and rubbish have been shown to cause high levels of air pollution in Iowa City; and

WHEREAS, air pollution resulting from open burning is a significant cause of respiratory problems for many citizens.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF IOWA CITY:

SECTION 1. Chapter 24 be amended by adopting the following:

"ARTICLE XI. OPEN BURNING PROHIBITED

Sec. 24-171. Open Burning Prohibited

No person shall ignite, cause to be ignited, permit to be ignited, allow, or maintain any open fire.

Sec. 24-171. Exceptions

(a) Open burning of the following types may be permitted, in compliance with Fire Department:

(1) Ceremonial or Controlled Bonfires. Ceremonial or controlled bonfires may be permitted.

(2) Disaster Rubbish. The open burning of rubbish, including landscape waste, may be permitted for the duration of the disaster period in cases where an officially declared emergency exists.

(3) Prescribed Agricultural Burns. The open burning of fields may be permitted if necessary for the maintenance of native prairie grass.

(4) Training Fires. Fires set for the purpose of bonafide instruction and training of public, institutional, or industrial employees in the methods of fire fighting.

(5) Flare Stacks. Open burning or flaring of waste gases may be permitted.

(b) Open burning for campfires and outdoor cooking is permitted without any burning permit if performed in an approved container constructed of steel, brick, or masonry.

Sec. 24-172. Penalties.

Any violation of this article shall be considered a misdemeanor or municipal infraction as provided for under Chapter 1 of the Code of Ordinances of the City. Such remedies shall be deemed cumulative in nature.

SECTION II. REPEALER. All Ordinances and parts of ordinances in conflict with the provisions of this Ordinance are hereby repealed.

SECTION III. SEVERABILITY. If any section, provision, or part of the Ordinance shall be adjudged to be invalid or unconstitutional, such adjudication shall not affect the validity of the Ordinance as a whole or any section, provision or part thereof not adjudged invalid or unconstitutional.

Passed and approved this 19th day of February, 1991.

_____
MAYOR

ATTEST_____

Approved by

_____
City Attorney's Offices

fire/openburn.ord

Section 9. OPEN BURNING

A. No person shall ignite, cause to be ignited, permit to be ignited or suffer, allow or maintain any open burning except as follows.

1. Open burning of the following types may be allowed provided a valid open burning permit is obtained:

a. Dangerous Materials. Fires for the disposal of dangerous materials or for the prevention of a fire hazard when other alternative methods of disposal are not available or impractical.

b. Training Fires. Fires set for the purpose of bonafide instruction, and training of public and/or industrial employees in the methods of fire fighting. These fires shall not contain any asphaltic of asbestos materials.

c. Disaster Rubbish. The open burning of rubbish, including landscape waste, for the duration of the community disaster period in cases where an officially declared emergency condition exists.

d. Flare Stacks. The open burning of flaring of waste gases, providing such open burning or flaring is conducted in compliance with Section 6 of this code.

e. Landscape Wastes. fires set for the disposal of landscape wastes including grass, leaves, weeds, trees, tree limbs, natural growth for land clearing, agricultural wastes, etc., providing these fires comply with Section 6 of this Ordinance.

f. Ceremonial Burning. Fires for ceremonial/recreational purposes such as American Legion flag burning, pep rallies, religious ceremonies, etc. These fires must be under the legitimate sponsor ship of a bonafide civic, fraternal, religious, educational, or similar organization and must comply with Sections 6 and 10 of this Ordinance.

g. Other Burning. Other open burning such as but not limited to native prairie management may be allowed on a case by case basis, through the issuing of an open burning permit, provided the Air Pollution Control Officer has determined, that the burning will not adversely affect the air quality or will not violate any Sections of this Ordinance and is reasonable and practical as compared to other alternatives available.

Open Burning Permits shall be issued by the Linn County Air Pollution Control Officer and the fire district having jurisdiction at the place of burning. Burning permits are valid provided the following conditions are met and maintained.

i. Burning is conducted during the dates stated on the permit;

ii. Unless otherwise approved by the Air Pollution Control Officer and the Fire Chief having jurisdiction, burning shall be conducted during the hours of one half hour after sunrise until one half hour before sunset;

iii. Burning is conducted in a safe and reasonable manner so as not to endanger life or property;

iv. Fires must be attended by the person the permit is issued to or his or her agent at all times. This person shall have the burning permit in their possession at the time of burning.

v. Open burning permits must be signed by the Air Pollution Control Officer and the fire district having jurisdiction at the place of burning.

vi. A fee of two dollars shall be charged for the issuance of open burning permit and shall be paid to the Linn County Health Department before permits are issued. Any permits issued for a period greater than one month duration shall be charged at the rate of two dollars per each month in length.

2. The following types of open burning are exempt and may be conducted without an open burning permit.

a. Open burning use solely for cooking out or barbecuing of food. These fires must be no larger than two feet in diameter.

b. Camp fires, burning clean wood material, when in association with camping out or similar related recreational activities provided that these fires comply with all other sections of the Ordinance and are no larger than three feet in diameter.

c. Fires for the disposal of household rubbish (including grass and leaves), but not to include rubber, and asphaltic compounds, or garbage at dwellings of four family units or less, conducted in an approved container. An approved container shall be any container whose capacity does not exceed three bushels in volume and has a one inch spaced wire or other suitable spark arresting device for the control of wind blown materials.

B. Unavailability of Exemptions in Certain Areas. Not withstanding Section 9(A) (1) (c) & (A) (2) (C) no person shall allow, cause or permit the open burning of residential waste, including landscape waste and leaves, within the city limits of Cedar Rapids, Hiawatha, Marion.

C. Any fire in violation of this Ordinance may be ordered extinguished by any agency designate by the Air Pollution Control Officer. This provision shall not limit the Air Pollution Control Officer from seeking penalties provided for in this Ordinance.

Resources

Following is a listing of statewide resources for you to contact. The state offices can put you in contact with their local affiliates.

Department of Natural Resources
(515) 242-5100
WWW.IOWACLEANAIR.COM

Polk County Air Pollution
(515) 286-3351

Linn County Health Department
(319) 398-3551

Your local health department

League of Women Voters
4815 University Avenue, Suite 3
Des Moines, IA 50311
(515) 277-0814

Sierra Club
3500 Kingman Blvd.
Des Moines, IA 50311
(515) 277-8868

Your local fire department for statistics on fires related to out-of-control leaf fires

Local hospitals for statistics on increased admissions from respiratory problems during leaf burning season

American Lung Association of Iowa
5601 Douglas Ave.
Des Moines, IA 50310
515-278-5864
1-800-LUNG-USA (586-4872)

References

American Heart Association

Iowa Department of Public Health
US Census Bureau

Iowa Department of Natural Resources

American Lung Association
Estimated Prevalence and Incidence of Lung Disease by Lung Association Territory, 1996

To Burn—or not to Burn

That hint in the air, of cold and snow to come. We feel the premonition of all of that in the autumn wind along with the aroma of smoke from burning leaves and yard waste. There is something magical about the way flames dance in a fire. Unfortunately, something sinister awaits us in the odors from backyard burning.

- The smoke generated by a large number of simultaneous leaf fires can cause significant health problems. Leaf smoke can irritate the eyes, nose and throat of healthy adults. It can be much more harmful to small children, the elderly, and people with asthma or other lung or heart diseases. This is because the visible smoke from leaf fires is made up of tiny particles that can reach deep into lung tissue and cause symptoms such as coughing, wheezing, chest pain and shortness of breath--symptoms that might not occur until several days after exposure to leaf smoke.

- Besides being an irritant, leaf smoke contains many hazardous chemicals, including carbon monoxide and benzo(a)pyrene. Carbon monoxide binds with hemoglobin in the bloodstream, which reduces the amount of oxygen in the blood and lungs. Carbon monoxide can be very dangerous for young children with immature lungs, smokers, the elderly, and people with chronic heart or lung diseases. Benzo(a)pyrene is known to cause cancer in animals and is believed to be a major factor in lung cancer caused by cigarette smoke. It is found in cigarette smoke and coal tar as well as leaf smoke.

- According to U.S. Environmental Protection Agency studies, sometimes concentrations of air pollutants resulting from leaf burning can be so high that the air does not meet federal health standards. In fact, in some areas burning of leaves and brush sometimes causes much higher levels of air pollution than all other forms of air pollution combined (such as factories, automobiles, and lawn and garden equipment).

- Leaf burning can also reduce visibility, create safety hazards, cause a nuisance, soil buildings and other property, and create additional demands on local police and fire protection.

So, burning is bad, then what are we to do? Why not try composting? Composting, is a natural process that has been going on since the first ferns started their slow decomposition into what we are now using to fuel our Harley Davidsons. Modern day composting speeds up the natural decay process of organic wastes. The result is a humus like compost end product by controlling air (oxygen), water, food, and temperature. Not only does composting get rid of yard waste, it turns this waste into a useful gardening product. And so we can safely and smartly answer the question of "to burn or not to burn" with a resounding **not**!