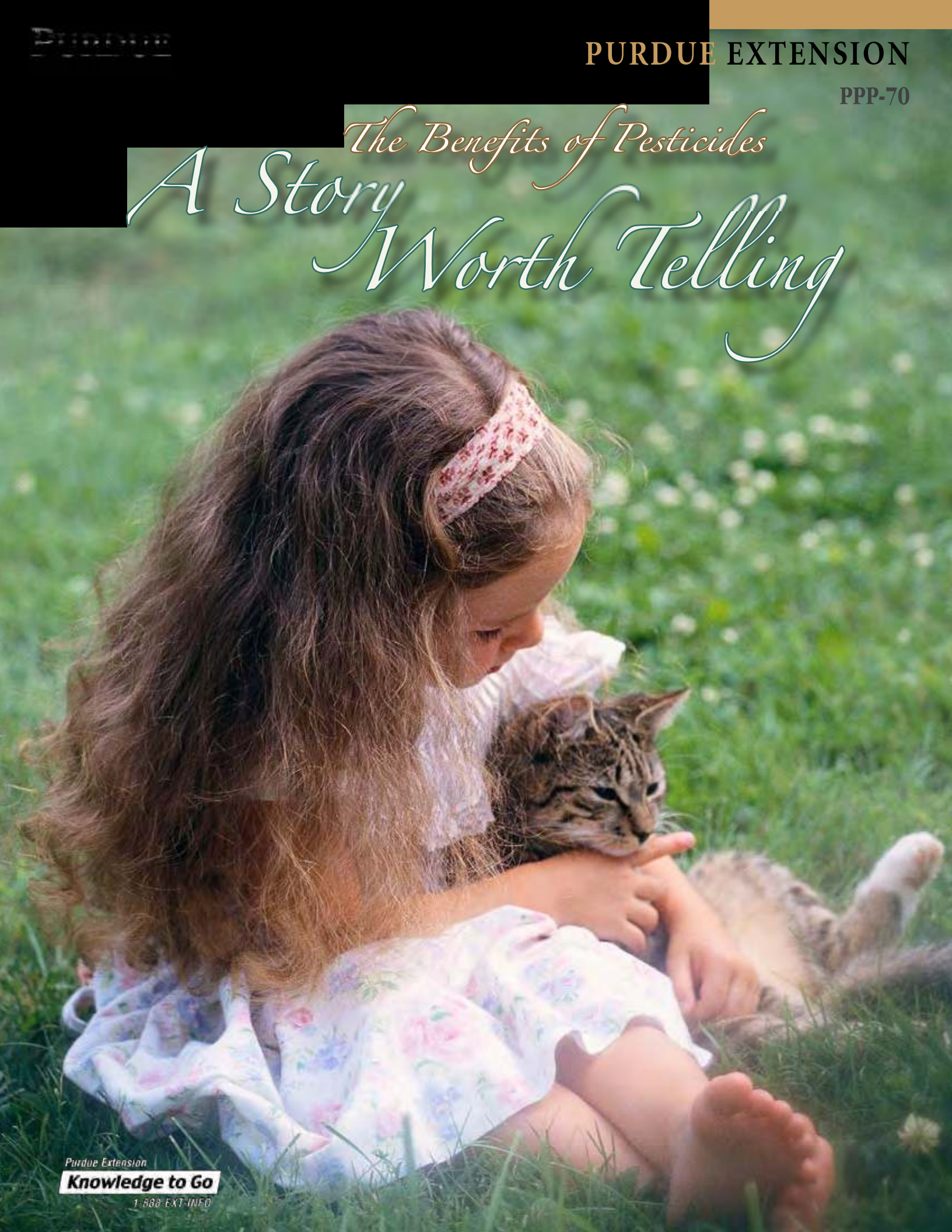


The Benefits of Pesticides
A Story Worth Telling





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Understanding Benefits Places Risks in Perspective

For decades, discussions among scientists and the public have focused on the real, predicted, and perceived risks that pesticides pose to people and the environment. Each use of a pesticide poses some level of risk, so it is not surprising that scientists, the regulated community, government officials, and the public need a realistic understanding of the risks associated with pesticide use. We must analyze how risk is assessed, identify the risks, and determine an appropriate level of concern.

There are significant risks associated with leaving certain pests uncontrolled; and, in some cases, pesticides are the only viable alternative. Properly used, pesticides provide benefits essential to our way of life. Uncontrolled pests can cause serious consequences:

- A person bitten by mosquitoes carrying West Nile virus may die.
- A child stung by bees, wasps, or ants may suffer a severe allergic reaction.
- A dog infested with fleas may become stressed to the point of illness.
- A farmer's diseased tomatoes may be declined by the cannery.
- A load of wheat contaminated with wild garlic may be rejected by the mill.
- A homeowner may have to spend thousands of dollars to repair structural damage caused by termites.

The benefits of pesticides commonly go unnoticed by the public. For example, if left unchecked, trees and brush growing beneath power lines (lower left) would cause power outages. Herbicide use by utility companies to prevent

undergrowth eliminates the problem and provides unobstructed access for maintenance and repairs. Road crews also use herbicides to control vegetation along highways, for safety reasons; clear roadsides increase visibility for drivers and allow water to escape more efficiently during a downpour or flooding. Herbicides also are used to fight invasive weeds in parks, wetlands, and natural areas.

Fred Whitford



Pesticides are used around our homes and businesses in ways we often take for granted. Plastics, paints, and caulks may contain fungicides to prevent mold. Toilet bowl cleaners and disinfectants often contain pesticides. Raw commodities and packaged grocery products—the foods we eat—are protected from insect contamination by the controlled use of insecticides in processing, manufacturing, and packaging facilities. Pesticides are used in grocery stores to manage insects and rodents attracted to food and food waste. There is little doubt that the proper use of pesticides improves our quality of life, protects our property, and promotes a better environment.

Benefits of Use Add to the Discussion of Risk

Understanding generates perspective, no matter the subject; and understanding the benefits of pesticides is essential to weighing the risks.

To identify potential risks associated with pesticide use, we must understand how risk is determined, what factors (including characteristics of the exposed population) control the potential for risk, what experience has shown about the risk, and what can be done to minimize the risk. Our conclusions then must be weighed against the benefits of pesticide use, factoring in any available alternatives as well as the benefits and risks of those alternatives.

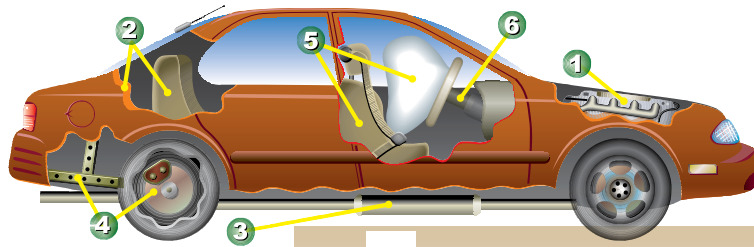
The following discussion on driving provides a benefit versus risk analogy that can be used in our discussion of pesticides.

Statistically, driving motor vehicles is risky: every nine seconds a person is injured in an automobile collision, and every 12½ minutes someone dies; that is 42,000 deaths due to motor vehicle accidents every year in the United States. If we are injured, we are likely to suffer loss of income while recovering. If we damage public or private property, we are liable for repairing or replacing it. And if we are held liable for the injury or death of someone else, the financial consequences can be astronomical. If we die in an accident, our families suffer both emotionally and financially.

Motor vehicles also impact the environment. Our land and oceans are continually explored for oil in support of the vast quantities we use. Vehicle exhaust releases carbon monoxide into the air, and we expose ourselves to gasoline and diesel fuels, which are known carcinogens. We kill countless butterflies, birds, and mammals on the highways, which commonly are built on productive farmland and, sometimes, sensitive environmental areas. The risks and losses are real and measurable, but the benefits are obvious—and most of us consider motor vehicles essential to everyday life.

The degree to which we feel in control influences our perception of risk.

the Automobile Analogy: Reducing Risk



RISKS	HOW REDUCED
Causes air pollution	1 Burn cleaner fuel
Depletes natural resources	2 Use renewable resources and recycling
Produces toxic gases	3 Install anti-smog devices
Susceptible to loss of control and damage	4 Engineer to handle better
Injurious to passengers in crashes	5 Equip with safety belts and airbags
Dangerous when driven recklessly	6 Enforce traffic laws

We generally agree that the benefits of driving a vehicle outweigh the risks of personal injury, death, or damage to the environment. But we are in control of certain decisions that affect the risk potential: what type of vehicle to purchase, how often it is used, how fast it is driven, whether to wear seat belts, etc. We continually seek to reduce driving risks by building safer vehicles and highways, by removing dangerous and incompetent drivers from the road, and by requiring drivers to pass a competency test and carry insurance. When we are in control of factors that contribute to risk, we accept it more readily.

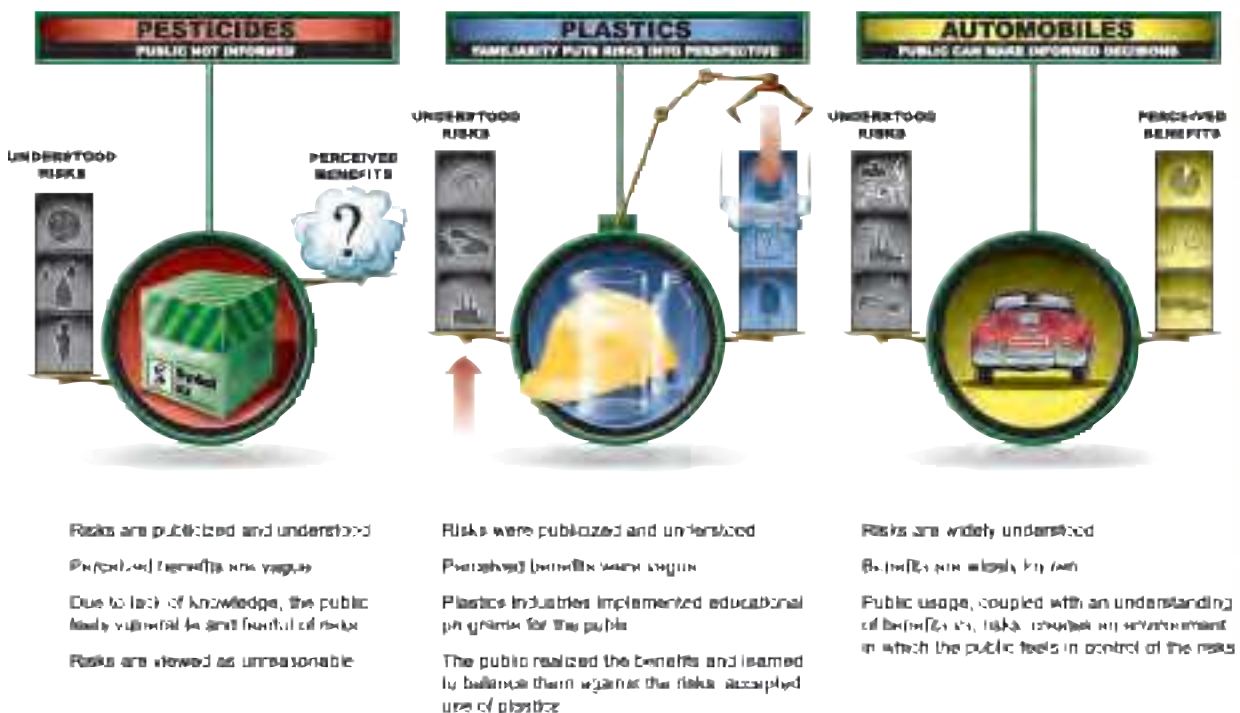
The federal government regulates risks associated with modern technologies. For example, the Food and Drug Administration (FDA) reviews the benefits and risks associated with new medicines. FDA registration guidelines require pharmaceutical companies to write instructions for physicians and patients, indicating possible side effects and what actions to take if they occur. As a society, we clearly want the benefits of prescription and over-the-counter medications, but we expect associated risks to be minimized through regulatory oversight; and we have the benefit of a final, personal level of control in deciding whether or not to use them.

The public may not recognize or fully understand the benefits of pesticides, or they may take them for granted. Most people are not knowledgeable of the federal and state regulatory requirements and the extensive registration approval process that must be met before a pesticide can be offered for sale. Likewise, many are unaware of the training and testing that professional pesticide applicators and farmers undergo to become certified. Most states

require certification and/or licensing of individuals who recommend or apply pesticides. Just as with medications prescribed by medical doctors, certain pesticides may be purchased only by licensed pesticide applicators and applied by or under the supervision of certified applicators. State and federal regulations govern how pesticide products may be used, and compliance is enforced at both levels.

Pesticide Benefits: A Story Worth Telling

Most of us acknowledge that the benefits of pesticides outweigh the risks, as evidenced by the continuing demand for more products to solve an ever-increasing array of pest problems: bacteria in hospitals, mold in homes, the gypsy moth in hardwood forests, etc. The pesticide debate is somewhat analogous to that of the plastics industry. We benefit from the use of plastics in great quantities, but media stories and publicity generated a few years ago created uncertainty that the benefits outweighed the risks. The plastics industry faced overwhelming opposition due to the risks: pollution of natural areas, landfill concerns, injury to wildlife (birds getting entangled in six-pack holders), human exposure to chemicals that might mimic human hormones, etc. But studies conducted by the American Plastics Council (<http://www.plastics.org>) suggested that providing the public factual information on the benefits of plastics would generate a more favorable attitude.



The American Plastics Council responded by running television commercials expounding the benefits of plastics in everyday products. The ads demonstrated that plastics are more than drinking cups and milk jugs. The council's message addressed the magnitude of plastics in our everyday lives: medicine containers, unbreakable plastic food containers, smoke alarms, eye glasses, sports and safety equipment, vehicle parts, refrigerators, soda containers, credit cards, toys, appliances, packaging materials, and much, much more. The advertising campaign made us realize that plastics provide benefits we take for granted. It also heightened environmental concerns over the volume of plastics entering our landfills, leading to widespread public participation in recycling programs.

Pesticides Provide Multiple Benefits

Overall, the public overlooks the benefits of pesticides. We have grown accustomed to buying fresh produce that is free of blemishes, and we expect canned fruits and vegetables to be free of insects. But do we give any thought to how this is achieved? Do we typically ponder the role of pesticides in keeping restaurants, malls, parks, and playgrounds free of insects, rodents, and poisonous weeds? It's a story worth telling.

Fred Whitford



Pesticides play a key role in keeping malls (left) and parks (below) clean, safe, and attractive.

Arlene Blessing



Chris Gunter



Wai-Ki Frankie Lam



John Woodmansee

Above: Pigweed infestation in a pumpkin patch.
Top Right: Early symptoms of bacterial wilt on muskmelons are wilted leaves and stunted plants; later symptoms are dead plants.
Right: Septoria leaf spot on tomatoes.
Background: The disease gummy stem blight has killed most of the green tissue of these watermelon vines; the melons will not ripen properly.





Corn rootworm photos by John Obermeyer

For decades, field crop producers in the Midwest were able to disrupt the corn rootworm life cycle using crop rotation. This prevented rootworm damage by larval feeding (top left and right) without the use of soil insecticides. Over time, this cultural practice has altered the behavior of the adult beetle in some areas. Female beetles once laid eggs exclusively in corn, but now they will move to soybean and other non-corn crops to feed on foliage (far left) and lay eggs. Eggs laid in these fields overwinter in the soil and hatch the following spring where corn has been planted. The subsequent larval feeding causes lodging and “goose-necking” of corn plants (above) that significantly reduces yield and harvest ability.

Bill Johnson



A no-till soybean field is overtaken by golden ragwort (cressleaf groundsel). No-till farming would be impossible without herbicides for weed control.