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All Gardens Great & Small by York Co. Horticultural Agent Tom Becker

## Choosing a Garden Sprayer

Looking for a new sprayer to control pests in the garden? There are many types of sprayers on the market today. Before buying ask yourself these questions:

Is the garden or landscape area small enough to use a manual, hand-held or hose-end sprayer? Who will use the sprayer the most? Do I want a sprayer with replacement parts? What will I use the sprayer for the most? Will I use the sprayer for a few fruit trees or shade trees? Do I want a sprayer light enough to carry? Do I want to attach the sprayer to a garden hose?

These and other questions should narrow down potential sprayers for your small, medium or large garden and/or landscape. For small jobs, a push-pull hand pump, compressed air or garden hose-end sprayer should be adequate. For general outdoor spraying, the compressed air sprayer is preferred.

Choose a sprayer with at least a one-gallon (for larger jobs, choose a 2.5 to 5 gallon) tank with a comfortable pump handle, control value and durable nozzle. Choose a large enough capacity to get the job done without refilling the tank.

Ideally, use up the entire pesticide mixture immediately. Do not store pesticides in a sprayer.

The compressed air sprayer requires forcing air into the sprayer by means of a hand pump plunger located on top of the tank. Depending on the type of sprayer you purchase, pressure is maintained by periodic pumping. The sprayer is well suited for spot herbicide treatments.

Sprayers with a nozzle attached to a metal wand work great for treating insects that inhabit the undersides of leaves. Also, injected molded plastic sprayers rather than stainless steel, brass or other metal sprayers are extremely durable, will not corrode and are relatively inexpensive.

For larger gardens, small farms, fruit trees or lawns, the back-pack or knapsack sprayer offers more capacity (2-5 gallons) and interchangeable equipment. Carried on your back, the sprayer operates effortlessly with the pump inside the sprayer and a side-mounted lever. Some types allow for abrasive ingredients like wettable powders while others do not. Check the operating guide before purchasing.

COLUMBUS, Ohio - Burgerlovers really can have it their way with a low-fat hamburger that tastes great.

Food scientists at Ohio State University have developed a filler for lean ground meat to make it taste as good as --- or, taste panel members say, even better — than their full-fat equivalents. Now re-

The garden hose pump sprayer uses a concentrated pesticide in an attached container connected to the hose. Care must be taken to prevent the pesticide from siphoning back into the garden hose and into the water source. Antisiphon devices are available to attach to the hose bib of outdoor faucets. Use these sprayers with caution to prevent backflow.

Hose-end sprayers apply a course sprayer pattern often used for lawn applications. Some allow for various dilution rates with greater than 100 gallons of capacity.

For those with very large trees, a power sprayer may be needed. Usually available in 5 to 30 gallon capacities, these sprayers are battery or electric motor or gasolinedriven. Constructed for pulling by a small garden tractor, these sprayers offer optional equipment like a boom with multiple nozzles to spray large lawn or garden areas.

For more information on sprayer calibration, cleaning and small farm sprayer alternatives, contact your Extension Agent or Master Gardener at Penn State Cooperative Extension.

Any questions regarding the above article can be addressed to Tom Becker, Penn State Cooperative Extension at (717) 840-8408.

Burger Possib searchers hope that consumers and manufacturers, who have been burned before by lower quality low-fat meat mixtures, will give their product a chance.

"You've got to give consumers something to try that tastes good," said Mike Mangino, professor of food science who, with food science students and professor emeritus Poul Hansen, has developed and tested the filler for ground beef and sausage.

The filler is whey protein, a gellike substance that holds moisture. Whey protein comes from whey, a byproduct of cheese-making. The whey protein allows a hamburger that's made from 90-percent lean ground beef to have the mouth feel and flavor of a burger with three times the fat.

Whey protein gels at 172-176 F, but cooking hamburger that high would dry it out. The trick, Mangino said, is to heat the whey protein before adding it to the ground beef.

To test the product, Hansen and students in an Ohio State technical problem solving class asked a major fast food retailer to help them conduct a taste test. Low-fat hamburgers were produced at a restaurant by restaurant personnel and served to a panel of restaurant administrators. The panel compared the low-fat burgers to the restaurant's normal full-fat burger without being told which was which. The burgers were the same in every way except fat, water and whey protein content. The results? Every one of the eight-member panel preferred the low-fat burgers and found them higher in acceptability, flavor, appearance and texture.

Even better, the low-fat burger is lower in calories (213 compared with 353) and higher in protein (23.5 grams compared to 19). The low-fat burger contains 54 percent calories from fat, compared with 78 percent in a regular hamburger patty.

Mangino has tested the whey protein in a breakfast sausage product, too.

"I was amazed how easy it was to do it," Mangino said. This time, a student panel gave this product high scores compared with sausage made with the same spices and ingredients, minus the whey protein.

There are, of course, downsides to these low-fat meat products, Mangino said. The first is expense. Whey protein costs between \$1.50 to \$2 a pound, compared with about 10 cents a pound for fat. Companies interested in selling the product would also have start-up costs associated with any new item.

The second downside is a lack of consumer demand. Just last month, McDonald's announced its discontinuation of McLean Deluxe, a low-fat burger made with carageenan, a seaweed extract, mixed with lean meat. Consumers preferred the restaurant's higherfat burgers. Mangino said that even though his product tastes better than other low-fat meat fillers, consumers have been burned too often to warm to another product touting the same qualities.

'But if the demand returns, we at least have a product that will give people something to try," Mangino said.

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