



Harmony Valley Farm

An update for our Community Supported Agriculture Members - Since 1993

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Silent Spring #4- Glyphosate-Roundup's Best Friend Part 2

by Sarah Janes Ugoretz

This week, we'll keep our attention squarely focused on glyphosate, the active ingredient in commonly used herbicides like Roundup. While we considered the potential as well as the demonstrated implications glyphosate has on human health in the previous article, this week we'll explore what glyphosate's widespread proliferation has meant for animal life and for our environment in general.

Thirty years ago, the U.S. Environmental Protection Agency (EPA) declared that glyphosate might be a cancer-causing agent. By 1991, however, the agency had reversed its stance, citing—rather ironically—the same study on which it had based its original, precautionary decision. Fast-forward to March 2015 and this study has once again found itself in the crosshairs, as a 17-member panel of researchers compiled by the International Agency for Research on Cancer (IARC) listed it as supporting evidence in its declaration of glyphosate as a human carcinogen.

In exploring glyphosate's potential as a human carcinogen, IARC panelists examined circumstances under which glyphosate might cause cancer. While Monsanto and others have pointed to a preponderance of negative studies, the IARC stands firm in its insistence that even a handful of positive studies—those that suggest there is a linkage—can justify naming a substance as hazardous. In the case of this highly cited study, three of the 50 mice exposed to a specified amount of glyphosate developed an unusual type of kidney cancer. According to Dr. Aaron Blair, a retired National Cancer Institute epidemiologist and chairman of the IARC researchers, "that type of tumor is rare...they literally don't occur, but they occurred when rodents were dosed with this stuff" (Pollack, 2015).

Researchers' sights are not solely set on understanding the connection between glyphosate exposure and cancer, however. In general, the primary question guiding many is more broad and centers on understanding the potential health effects of low dose exposure over an extended period of time. This is a question we do not yet have an answer to. Yet as studies continue to develop—especially longitudinal studies—we may begin to put more of the puzzle pieces into place. In Germany, for instance,

This Week's Box

PORCELAIN OR ITALIAN GARLIC: Add to your favorite summertime vegetables or add minced garlic to summer salsas & chutneys to add a nice background flavor.

SWEET SPANISH ONIONS: Caramelized onions would be a delicious addition to a grilled burger. Check out thekitchn.com's how-to tutorial.

GREEN BEANS: Green beans make for an easy summer side dish. Check out the recipe for Green Beans with Lemon and Garlic on foodnetwork.com.

ZUCCHINI OR FLYING SAUCER SUMMER SQUASH: You can make noodles out of your zucchini, also called "zoodles." If you don't want to invest in a Spiralizer, you can easily use a vegetable peeler to cut the zucchini into long, thin ribbons.

ORANGE CARROTS: Carrots are deliciously crisp and crunchy when raw, but they become silky soft when cooked. Try braising your carrots with dill for a simple way to enjoy fresh carrots. You don't even need to peel them!

GREEN BELL PEPPERS: If you don't snack on your peppers raw, make a classic Denver omelet. For an even easier route, scramble your eggs with chopped green peppers, mushrooms and shredded cheese.

BROCCOLI OR CAULIFLOWER: The texture and taste of broccoli is delicious when paired with pasta. Toss it with pasta & sausage or try making a pasta sauce out of broccoli.

SUNGOLD OR GRAPE TOMATOES AND A VARIETY OF LARGE TOMATOES: Try making a grilled zucchini and tomato salad. Grill the zucchini and cut it into bite sized pieces, then toss with tomatoes, chopped fresh herbs and balsamic vinegar. Tomatoes are just starting to ripen. Get ready for larger amounts coming next week!

SWEET CORN: Keep it cold! The key to preserving the freshness and sweetness of sweet corn is to keep it cold! Store it in the coldest part of your refrigerator and eat it within a day or two.

SUN JEWEL OR FRENCH ORANGE OR SWEET SARAH MELONS: Sun Jewel is an oblong, yellow-skinned melon with a crisp, sweet white flesh. French Orange Melons are round with creamy-yellow rind and a deep orange flesh. Sweet Sarah has a finely netted rind and the flesh is sweet and a typical orange cantaloupe color. Uncut melons can be stored on your counter until fully ripe. Store cut melon pieces in an airtight container in your fridge.

ARUGULA: Arugula can be added to salads or tossed on top of a pizza just after baking. You could also make the Arugula Pesto featured on saveur.com.

TOMATILLOS: See this week's vegetable feature on page 3 for more information.

JALAPEÑOS: Jalapeños lend a nice spark to salsas, marinades, jellies and cheese. Try them raw, roasted, lightly sautéed or pickled and notice how the heat level and flavor subtly changes with different preparations.

GOLDEN POTATOES: There's no need to peel the tender skins before enjoying these potatoes. Try steaming your potatoes and serving with butter and fresh dill.

CHOICE ITEMS:

- **ITALIAN BASIL:** Please only take small handful of basil per household.
- **EGGPLANT:** Please take only one portion of eggplant-similar to what was packed in last week's share.

See the third page for the vegetable feature and recipes.

researchers found glyphosate in the urine of dairy cows, rabbits and humans at levels ranging from 10 to 35 parts per million (ppm) (Krüger et al., 2014). Recall from our discussion last week that chemicals like glyphosate are biologically active at parts per billion (ppb) levels (Hemmelgarn, 2015). Upon dissection, the tissues of each cow's kidneys, liver, lungs, spleen, muscles and intestines were found to contain similar amounts of glyphosate residue as their urine. As Leu (2015, p. 91) explains, "this means that glyphosate is not being passed through urine without

affecting the organism, and that meat and dairy are an additional source of glyphosate for humans."

A number of studies have also documented the various ways in which glyphosate has resulted in teratogenicity (birth defects) in animals. In 2003, researchers found that of those tadpoles exposed to glyphosate at rates commonly found in the environment, 55 percent experienced deformities to their tails, skulls, mouths, eyes and vertebrae (Lajmanovich, Sandoval, & Peltzer, 2003). Meanwhile, Dallegrave

et al. (2003) found that rats that were exposed to glyphosate produced offspring that were more likely to have skeletal abnormalities. Perhaps most significantly, a 2010 study demonstrated the ways in which glyphosate actually causes teratogenicity (Paganelli, Gnazzo, Acosta, López, & Carrasco, 2010). Paganelli et al. found that at levels as low as 0.5 ppm, glyphosate is able to disrupt the retinoic acid signaling pathway—a crucial biochemical mechanism. All vertebrates (yes, that includes humans) use this mechanism in order to ensure that bones, organs and tissues develop at a specific time and in the correct place within embryos. If malformations begin to occur, the mechanism enables corrective action. Disrupting this mechanism is akin to scrambling a motherboard—essentially, signals may be sent at the wrong time, resulting in the incorrect formation of organs and tissues and leaving malformations uncorrected.

Much like neonicotinoids, research suggests that glyphosate also has sub-lethal impacts on honeybees. Honeybees that were fed sub-lethal doses of glyphosate spent more time—and more often took indirect paths—returning to their colonies. As the authors note, the navigation of these honeybees appears to be impacted by consuming concentrations of glyphosate that are commonly found in agricultural settings—a factor that may have “long-term negative consequences for colony foraging success” (Balbuena et al., 2015).

Environmentally speaking, glyphosate residues—primarily glyphosate’s degradation product, aminomethylphosphonic acid (AMPA)—have been detected in soil, air, surface water and seawater. Studies show that these residues persist and accumulate over time with ongoing agricultural use (Leu, 2015). While glyphosate attaches firmly to soil initially, these particles eventually migrate throughout the environment until they finally dissolve in water (Grossman, 2015). The U.S. Geological Survey (USGS) recently sampled a collection of rivers, streams, ditches and wastewater treatment plant outfalls in 38 states. Their findings revealed that a majority of those waterways tested contained glyphosate residues, as did 70 percent of rainfall samples (Grossman, 2015).

Though glyphosate’s weed-killing capabilities have had a number of major environmental impacts, one has received a great amount of attention as of late: the decimation of milkweed plants. As the usage of genetically

modified (GM) Roundup Ready crops have proliferated throughout the Midwest, the application of Roundup has wiped out enormous tracts of this plant, which serves as the monarch caterpillar’s sole source of food (Pleasants & Oberhauser, 2012). In the last 20 years, it is estimated that the North American monarch butterfly population has declined by 90 percent. This decline coincided with the loss of over 165 million acres of habitat—owing primarily to the pervasive use of glyphosate (The Xerces Society for Invertebrate Conservation, 2014). The U.S. Fish and Wildlife Service is currently conducting a review to determine whether to place the North American monarch population under Endangered Species Act protection. Tierra Curry, a senior researcher with the Center for Biological Diversity, believes that this is the “most powerful tool” we can leverage to save America’s monarch population (The Xerces Society for Invertebrate Conservation, 2014).

In agricultural applications, glyphosate has been touted as a tool that will ultimately assist in reducing pesticide use, as Roundup ready crops will theoretically thrive with fewer applications of only one herbicide throughout the growing season. However, as many conventional farmers have come to rely almost exclusively on Roundup year-in and year-out, weeds that have been able to survive have spread their seeds. Now, what we’re left with is an evolutionary inevitability—Roundup resistant weed species. Facing this new dilemma, agro chemical companies are looking to develop the next GM varieties of corn and soybeans that can withstand chemical formulations like those that make up 2,4-D and dicamba, which can be described as potentially more dangerous than glyphosate (Bohnenblust, Vaudo, Egan, Mortensen, & Tooker, 2015). Unsurprisingly, this has been embraced as a “new era,” representing “a very significant opportunity” for chemical companies like Dow Chemicals (Johnson, 2013).

We opened our first Silent Spring article with news that The White House had taken an historic step in revealing the *National Strategy to Promote the Health of Honey Bees and Other Pollinators*. Investing in the protection, restoration and enhancement of pollinator habitats is a critical piece in proactively responding to the rapid decline of various pollinator populations within North America. In a similar vein, designating North American monarchs as an endangered species would, in theory, work to protect

them and increase their odds of long-term survival. However, without a rigorous plan to curtail the use of harmful pesticides like neonicotinoids and glyphosate—classes of compounds and chemicals which we now know more than ever are undeniable points of concern for the health of humans, animal life and our environment more broadly—these efforts may ultimately be for naught. Even with the establishment of widespread tracts of native prairie land, pollinators and other beneficials will continue to be exposed to these harmful chemicals for the simple fact that they are not sedentary organisms. They move. They pollinate. As Dr. May Berenbaum says, “pollinators are [a]...keystone species. You know how an arch has a keystone? It’s the one stone that keeps the two halves of the arch together... If you remove the keystone, the whole arch collapses” (PBS Nature, 2007).

Next week, we’ll turn our attention to the precautionary principle and how it has—or has not—been applied in relation to the adoption and widespread application of such substances as neonicotinoids and glyphosate.

All article sources may be found on our blog www.harmonyvalleyfarm.blogspot.com



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To order, please call 608-483-2143 x2 or email

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Please be sure to include your name, telephone number and pick-up location with your order!

See the third page for this week’s feature about tomatillos and delicious recipes! Available on our blog at www.harmonyvalleyfarm.blogspot.com or on our website

Vegetable Feature: Tomatillos

by Andrea Yoder

Tomatillos are an interesting “vegetable,” which are technically a fruit. While we plant them alongside our tomatoes and they are often referred to as a “green tomato,” they are a bit different. Tomatillos grow on massive plants that are similar to a tomato plant, but with more of a wild, vine-y appearance. Their main stem is thick and sometimes resembles a small tree trunk. The plants grow over seven feet tall, so we put stakes in between and tie the plants to them progressively as they grow in order to keep the plant upright and the fruit off the ground. Tomatillos grow from pretty little yellow blossoms which are a favorite food source for bumble bees and other pollinator creatures. The fruit is hidden inside a husk that looks like a little paper lantern. You know the tomatillo is ready to pick when it fills the husk completely. While most tomatillos are green, this year we’re trialing a purple variety that will be dark purple when ripe. It’s supposed to have a more pronounced, sweet, fruity flavor. We’re hoping to send some your way in a future delivery.

Tomatillos can be eaten raw or cooked. They have a mild flavor with a slightly tart and sometimes fruity flavor. In their raw form they are firm with a dense flesh, but when you cook them they break apart and become more like a sauce. Before you use them, you need to remove the outer husk which is not edible. The fruit inside might feel a little sticky, which is normal. Just give them a quick rinse and you’re ready to go. Tomatillos are most commonly used in salsa verde, a popular green salsa made with onions, garlic, lime, jalapeños and cilantro. This salsa can be prepared with either fresh or cooked tomatillos. If you want to kick the flavor of your salsa up a notch or two, roast the tomatillos and other vegetables on a grill or open flame before you put them into the salsa. But don’t stop with just salsa, there are a lot of other ways to utilize tomatillos! They can be incorporated into soups, stews and a variety of sauces. They are also a delicious ingredient in fresh vegetable salsas and salads. Another tasty preparation is to cut thick slices of tomatillos, bread them and pan-fry them.

Tomatillos are super-easy to preserve for use in the off-season. Simply remove the outer husk and wash and dry the fruit. They can be frozen raw in a freezer bag. When you’re ready to use them, simply thaw them and use them in soups, stews or cooked salsas. The texture when thawed will be soft. We’ll be offering tomatillos as a produce plus item soon!

If you’re looking for some interesting recipe suggestions, check out MarthaStewart.com. In their cooking section they have a “*Seasonal Produce Recipe Guide*” that features many of the vegetables in your box this week including tomatillos. It’s a great resource to find some tasty ideas this summer!

Chilled Buttermilk Tomatillo Soup

Recipe featured on Marthastewart.com in their “*Seasonal Produce Recipe Guide*” for Summer.

Yield: 4 servings

2 tsp extra-virgin olive oil

1 medium-size onion, coarsely chopped

1 pound tomatillos, husked, rinsed, and quartered

2 garlic cloves, minced

1 jalapeño pepper, seeded and finely chopped

3 cups chicken stock

1 tsp ground cumin, plus a pinch for garnish

2 Tbsp coarsely chopped cilantro, plus

4 sprigs for garnish

1 cup buttermilk

Salt and freshly ground black pepper, to taste

1. Heat the olive oil in a medium saucepan over medium heat. Add the onion and cook until translucent, about 10 minutes. Reduce the heat if the onion begins to brown.
2. Add the tomatillos, garlic and jalapeño and cook for 5 minutes. Raise the heat to medium-high, add the chicken stock, cumin and cilantro, and cook 10 minutes more. Remove from the heat and cool.
3. Pour the mixture into the bowl of a food processor and puree until smooth. Add the buttermilk, salt and pepper and pulse to combine. Transfer to a bowl and chill in the refrigerator.
4. Ladle the soup among 4 bowls and garnish each with a cilantro sprig and the cumin.

Tomatillo Dressing

Recipe borrowed from *Vegetables Every Day* by Jack Bishop

Yield: 1 cup

4 medium tomatillos, husk removed

1 Tbsp lime juice

¼ cup extra-virgin olive oil

Salt, to taste

Freshly ground black pepper, to taste

Wash the tomatillos and cut into quarters. Place the tomatillos, lime juice and oil in a food processor or blender and puree until smooth. Add salt and pepper to taste. Use the dressing immediately or refrigerate in a covered container for several days. Shake well before using.



Fresh Tomatillo-Tomato Salsa
see marthastewart.com for recipe.