Stephenson County SWCD Newsletter

VOLUME 41, Issue 2 www.stephensonswcd.org Summer 2021

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Fall Fish Sale

Friday, August 27, 2021:
Last day to order fish (includes grass carp).

Since Andry's fish farm is in Indiana and they are crossing state lines fish orders need to be turned in earlier.

Wednesday, September 15, 2021 @11:00AM:
Pick up fish at the SWCD Office

Fall Fish forms are available at the Stephenson County SWCD office on a shelf in the entryway; or on our website: www.stephensonswcd.org

Stephenson County Soil & Water District Well Water Testing Program

The district is pleased to be offering a well-water testing program again this year. Well water can be tested for nitrates, and metals.

As in previous years the program is organized as a drive which helps to keep the cost down. See below for dates.

Peace of mind about the water you are drinking truly is as easy as 1, 2, 3…

1 **Monday - Friday**
September 20 – 24, 7:00 – 3:30
Purchase Water Test Kits at the SWCD Office.

2 **Monday or Tuesday (morning)**
September 27 – 28
Collect Water Samples

3 **Tuesday, September 28**
By 3:00 pm
Return Water Samples to the SWCD Office, for immediate shipment to testing laboratory.

Note: PurTest® Bacteria self-testing kit is available from the district for $20.00. This is not part of the regular testing kits.

See page 8 for more information ▶

What Are Prairie Strips?

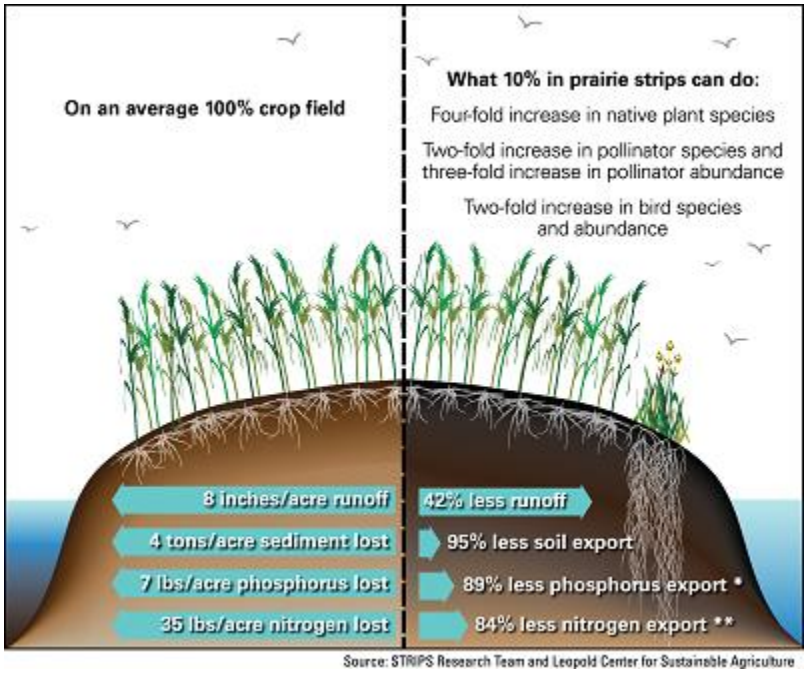
By Luke Tweeten

https://bloximages.chicago2.vip.townnews.com/iowastatedaily.com/content/tncms/assets/v3/editorial/1/5c/15c45a06-6a78-11eb-bef7-03a75e3021a3/6021e9522931b.image.jpg?resize=945%2C630

Prairie strips are a conservation practice that protect soil and water while providing habitat for wildlife. Portions of a crop field (typically 10-25%) are taken out of production and are planted with strips of native grasses and forbs (flowers). The prairie plants, with their deep, extensive root systems and stiff, sturdy stems are extremely effective at facilitating rainwater infiltration and preventing sediment runoff. This diverse perennial vegetation is oriented linearly parallel to the rows of a crop field. To get the most benefit, the strips are often strategically placed in areas of the field where crop yield is lowest. In row crop production systems, prairie strips can be placed around the field, through the field, in terrace channels, next to waterways, or on pivot corners. The STRIPS (Science-Based Trials of Row crops Integrated with Prairie Strips) research team at Iowa State University has shown that by converting just 10% of a field to prairie strips, benefits include:

- 42% reduction in water runoff
- 95% reduction in soil loss
- 89% reduction in phosphorus runoff
- 84% reduction in nitrogen runoff
- Increases in beneficial insects, pollinators, and wildlife.

What Are Prairie Strips? (Article continued from page 2)



https://www.nrem.iastate.edu/research/STRIPS/files/page/images/stripsinfographic_small.png

Prairie strips (CP-43) are a new practice under the continuous Conservation Reserve Program (CRP). Prairie strips may not exceed 25% of the cropland area per tract and may range from 30-120 feet in width. Machinery traffic is allowed on locations that replace turn rows on the perimeter of the field. CRP offers 10- or 15-year contracts which offer cost-share for the establishment of prairie strips along with annual rental payments on the acres enrolled.

To learn more about this new practice and for more information about signing up for CRP, please contact:

Stephenson County USDA Farm Service Agency (FSA) - (815) 235-2141 ext. 2

OR

Stephenson County USDA Natural Resources Conservation Service (NRCS) - (815) 235-2141 ext. 3

Sources

- https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/FactSheets/2019/crp_clear_initiative_prairie_strip_practice-fact_sheet.pdf
- https://pheasantsforever.org/BlogLanding/Blogs/Pheasants-Forever/CP43-Prairie-Strips-Today%E2%80%99s-New-Habitat-Practice.aspx
- https://www.nrem.iastate.edu/research/STRIPS/content/what-are-prairie-strips

Little Bluestem Plots

By Abby Mielke

On June 16, 2021, three employees from the Elsberry Plant Materials Center (PMC) in Elsberry, Missouri arrived at the property of Denny and Pat Dietmeier, near Ridott, to install evaluation plots of little bluestem. The plantings consist of 3 selections of little bluestem being evaluated - Aldous, Ozark Germplasm, and the northern selection. The plots are 10' x 20' in size, 3 plots per replication, 4 replications. This release is being selected as a forage-type warm season grass so PMC requested the site to be on soil indicative of pastureland, but not required. PMC performed all the pre-planting and planting efforts. Once the little bluestem grasses have emerged, PMC will return to apply a herbicide on the competing grasses. This site will then be monitored annually for at least the next 2 years.

Little Bluestem is one of the most widely distributed native grasses in North America. Little bluestem is a warm season prairie grass found native in almost all states of the United States and parts of Canada. It is very hardy and drought tolerant. It is a short bunch grass growing 3' or less in height. It creates great habitat and food for small birds, mammals and insects. Its roots stretch up to 5' making it very drought tolerant.

PMC is in the final stages of releasing a little bluestem (*Schizachyrium scoparium*) selection from the northern part of the service area and contacted the NRCS field offices requesting volunteer sites to plant their plots. Occasionally, the field offices are contacted on different species of prairie plantings whether they are plants, shrubs or trees in different types of landscapes. This is at no cost to the producer. If this sounds like something you may be interested in, contact Abby Mielke, Soil Conservationist, at the Freeport NRCS field office and we will put you on a list.

From the book- WATER IN PLAIN SIGHT by Judith D. Schwartz

The factors that contribute to plant resilience also help determine how crops take up water. Plants vary in water usage efficiency, depending on their stage of development and the state of their health. Rather than being passive recipients of water, plants actively influence the flow and cycling of water. I wanted insights on whether plants grown as crops also manage water-and whether healthier plants are more effective managers.Specifically, I was anxious to learn how understanding healthy plant-soil interactions can inform farming practices so we can make better use of water.

In this time of trepidation about water, driven by shortages in the Southwest and particularly in California, there's talk about the water foot-print of various foods. I take issue with the one that gets the most ink, that of a hamburger, because the 450 gallons of water for a quarter pound patty is predicated on growing grain to feed the animal, which is a poor use of resources and results in meat that's less healthful than pasture-raised. Also, as we have seen, restorative grazing can enhance land function so that more water remains in the ecosystem. But plant-based foods don't get off easy either. We're told, for example, that a tomato "costs" about thirteen gallons of water, eight ounces of broccoli accounts for 19.5 gallons and, and, notoriously, that an almond requires a gallon per nut.

Could it be that healthier, more resilient tomatoes, broccoli heads or almond trees use water more frugally and therefore need less? If so, this seemed something we might want to know.

Circling around the linkages between high-performing plants, healthy living soil and water efficiency of plant health, pictorially as a pyramid where four levels ascend toward a peak of optimal resilience, function, and efficient water use.

Stage one is successful photosynthesis: the plant converts simple sugars to complex carbohydrates and polysaccharides. This stage imparts resistance to the basic soil-borne pathogens a plant would encounter.

At stage two, the plant synthesizes complete proteins. Since many common crop pests-aphids, whiteflies and larval insects cannot digest complete proteins, this adds another layer of protection.

Stage three marks a higher level of nutrition in which surplus energy is stored as lipids, fats and oils, making for stronger cell membranes. At this point crops can stand up to airborne pathogens like blights and mildew and many bacterial threats.

A plant that reaches stage four produces "plant secondary metabolites,"the aromatic compounds- think essential oils, i.e., that which makes, say, rosemary smell like rosemary-that embody the plant's immunity, properties that are then conferred to the animals and people that eat the plant. Crops at this pinnacle not only repel a higher order of pest and pestilence, but also have more resources with which to attract pollinators, neutralize toxins and withstand stresses.

Consider how crops use water.Plants require water for both photosynthesis and respiration, distinct processes that use water differently. Photosynthesis employs water to create sugars and build biomass. In respiration, the plant metabolizes (breaks down) sugars in order to reap that energy. Respiration is most prevalent at night, when no photosynthesis occurs. Some liken plant respiration to "breathing," a metabolic process that takes in oxygen (0_2) and emits CO_2• Plants with a high level of nutrition need less water for both photosynthesis and respiration. Plus, they maintain a positive balance between the two processes: when the balance tilts toward photosynthesis, there's growth; more respiration means growth is curtailed. Good nutrition can significantly reduce a plant's water requirements.

Here is why: when a plant is proficient at drawing nutrients from its surroundings, photosynthesis becomes efficient. "If the plant can grow more efficiently, fixing more biomass in a shorter time, then it may use less water as compared to a plant in a low fertility or low carbon soil, struggling for nutrients and marking time."

Efficiency also supports the plant's ability to produce lipids, "When plants reach optimal levels of health, they'll begin forming elevated levels of fats, oils and lipids. Seen by the glossy waxy sheen on the leaf surface. That coating is insulating that plant, cooling it, and preventing rapid water loss. Therefore, nutrition has a big impact."

"Since plants thrive best within certain temperature ranges, less water is needed to control these temperatures, making the system more water efficient." Plants that produce lipids themselves, without relying on evaporation and therefore losing water.

This is particularly relevant to respiration, as higher temperatures increase the rate of transpiration. Plants with a moisture-conserving lipid coating do not need to burn through water to maintain temperature and therefore do not experience lackluster growth.

WATER IN PLAIN SIGHT (article continued from page 5)

The important thing to recognize is this: a plant cannot get there alone. To paraphrase that oft-quoted African proverb, "It takes a village to raise a child," we can say, *it takes a soil community to feed a plant.* Any farmer or gardener who successfully nurtures plants is working in partnership with microorganisms, consciously or not.

"Plants are no different from us in that they are hugely outnumbered by microbes-and depend on them for so much," says Johnson. "These plant/soil microbial community systems are much like us. We are outnumbered ten to one in cell count when we compare the number of cells in our body to the number of microbial cells we have. These microbes help digest our food, generate nutrients for us, synthesize vitamins, detoxify carcinogens, promote cell renewal and activate and support our immune system. They even control our appetites and cravings and are able to turn on and off genes in our body that regulate brain development and emotional behavior. We, as a superorganisms, are totally dependent on the form, function and proper operation of our microbial 'symbiont' partners and disruptions can promote catastrophic consequences. I expect plant/ soil microbial systems are no different."

"Soil is to the plant as the rumen is to the cow." A cow's rumen, the first of four compartments in a ruminant's digestive tract, goes to work on the forage the cow consumes, fermenting and processing it for the animal to assimilate. In the same way, soil is the site where nutrients are broken down and provisioned for the plant to take in.

Soil-meaning the entire living soil community as the digestive system of the plant. The plant, essentially "out-sources" the task of digestion to the surrounding soil. In consequence, the process of nourishing a plant cannot be considered in isolation. Soil conditions and soil microbiology are integral to how well a plant crop is "fed."

This sheds light on the term *plant nutrition,* which refers to the availability and absorption of the chemical elements a plant needs to grow, develop, and sustain itself. This is not a formula. You cannot simply provide crops with set amounts of mineral nutrients and expect them to thrive. Additives would have to be what a given plant needs and provided in a form the plant can absorb. Nourishment is not a one-size fits all recipe. Rather, a plant's nutritional status is the culmination of multiple interactions between the plant, the atmosphere, the soil and the mineral substances essential to living processes.

The role of soil in plant nutrition has huge implications for the amount of water that crops need. A plant primarily takes up water through its roots, so moisture at the root zone, the rhizosphere, is its main reservoir. Plants growing in healthy living soil will form relationships with root, or mycorrhizal, fungi. These fungal networks can tap into water sources that a plant's own roots are unable to reach, expanding the plant's range up to several hundred times.

As a result, associations with mycorrhizal fungi keep plants hydrated during periods of water scarcity. "When you have soil at a certain level of dryness, the film of water around each soil particle becomes so tightly bonded that the plant roots can no longer extract it," he says. "But mycorrhizal fungi can, and they extract and provide that water to plants. There's an intelligent ecosystem at work. As plants dry out, mycorrhizal fungi will automatically extract water and transfer it to plants. "These beneficial fungi also solubilize minerals, meaning they break down substances so that they can be carried in water. This makes nutrients that might be present in the soil, such as phosphorus and many key micro-nutrients, available in a form a plant can utilize. And, in turn, it enhances composition of organisms shifts toward fungi. In the wave's initial ripples, plants get the benefit of bacterial metabolites, byproducts of bacterial work that provide mineral nutrition in a more complete form than simple ions. When this happens, Kempf says, "a plant's energy efficiency goes up dramatically."

To clarify: Kempf distinguishes between two models of plant nutrition. In one, crops absorb nutrition dissolved in soil moisture in the form of ions, or simple charged particles. This is the model in farming today, which he says is basically "glorified hydroponics" that reduces the role of soil to "providing a base for the plant." This system is artificial, he says, because it is not how plants operate in nature. The other, less easily studied in a lab, is "real-world agriculture" in which plants procure nutrients through synergistic interactions with soil organisms. When a plant is fueled directly by microbial metabolites, Kempf says, it can access nutrients at lower moisture levels.

He explains that while ions are only transported in water, microbial metabolites can be absorbed in low-moisture conditions. Plus, converting simple ions to complex compounds-such as converting nitrate to amino acids, the building blocks of protein-consumes a significant amount of a plant's energy. With complete compounds available to them, the plants now enjoy an energy surplus. That spare energy is stored as fats, just as it is with people and animals. Robust plants nourished in a biologically active system may have three times the lipids needed to form cell membranes,he says. As it did with surplus sugars, the plant now begins sending lipids through the roots as root exudates.

WATER IN PLAIN SIGHT (article continued from page 6)

This in turn begins to tip the microorganism balance toward fungi, including mycorrhizal fungi, which get to work on the lipids, breaking down the substances as far as they can be broken down. This activity, described by the less-than-appetizing term *fungal digestion,* is pivotal to the production of humus.

Humus, you may recall, is a stable material that is at once a sink for carbon and a sponge for water, the loamy earth's own hallowed elixir. What Kempf proposes here that's new is this: the lipid content determines the cut-off point at which plant matter can no longer be digested. Plants form lipids once they reach a certain threshold of vitality and nutrition. Therefore, what governs the creation of humus is not the quantity of plant material-the biomass-but its lipid content, which rises according to the level of plant nutrition. In other words, humus formation is to a large degree contingent on healthy plants.

The connection between healthy plants, carbon and fungi in the soil, and water efficiency is starting to gain traction. Research, including the Rodale Institute Farming Systems trial that has been in operation for thirty years, has documented improved water use efficiency and water holding capacity on farms that practice organic methods compared with conventional systems.

New Mexico State's David Johnson studies soil microbiology to better understand which conditions support increased carbon in the soil. While he was not specifically seeking data on water use, what he found on that score surprised him: soil that sustained larger fungal populations and higher carbon levels doubled the crop yield that land could produce with the same volume of water.

"A healthy soil microbial community and plant system appears to be able to extract needed nutrients and water on the Walmart shipping model: "everything just in time," he says. This activity "requires energy, and the plant-soil-microbe system elegantly shuttles this energy when and where it is needed and has many feedback mechanisms to assess when it has a sufficient amount of a nutrient and then reduce the energy flow for that process." Even with optimal soil conditions there are limits to plant production, Johnson continues, "most likely limited by the amount of sunlight available, with the next limiting factor being water. Nature does everything in small steps. The energy release from the chemical bonds in energy molecules, such as sugar and starches, is done in small steps with a small component of energy utilized in each step. In nature, water was also done in small steps previous to the extraction of carbon out of the soils. We now do not have the capacity to slow down this flow of water. Some soils do not even let the water into its structure, and it becomes runoff. In other soils it flows through too rapidly and leaches nutrients into lakes, aquifers and oceans. Carbon in all its forms-soil organic matter,aggregates, mucilages, glues, glomalin, humic substances-helps open up a soil so it can receive the water while also giving the soil the structure and capacity to store that water. In our sandy soils in the Southwest, a **1** percent increase in soil carbon promotes a quintupling of water storage ability."

When you are growing crops, it does not matter if the water arrives by thunderstorm, pipe, sluice, or sprinkler. The moisture needs to stay in the system, and that requires living soil with a high carbon content. Says Johnson: "It is not what you get, it is what you keep that is important."

John Kempf's Soil Regeneration Cascade illustrates a notable, and even admirable, attribute of plants: their proclivity, when in a fully functional system, to create the conditions to ensure that they will thrive. In this instance, the plants' wish list consists of soil that's rich in humified carbon. Later I'll share more on the clever strategies of plants from Australian soil scientist Christine Jones. For now, I'll leave you with this assertion from Kempfs website: *We know that healthy soil will lead to healthier crops. Interestingly enough, however, the fastest way to regenerate soil is to grow extraordinarily healthy crops.*[7]

Now for the problem: none of this great stuff is going to happen if chemical inputs like fungicides, pesticides and herbicides are added to the soil. It does stand to reason that spraying to kill off fungus precludes alliances with mycorrhizal fungi, the fungi a farmer wants. And that might seem a tolerable loss, even a calculated one. But the reality is that chemical amendments inevitably kill more than the targeted species. In a biologically dynamic setting like living soil, this sort of collateral damage is rarely benign. Destroying one set of pests may provoke exponential growth in others, only to throw an entire system out of balance. Or, as we've seen in the "superweeds" scenario, species may build up immunity to the very formulae intended for their demise so that they rebound in greater force. Other practices that disrupt a functional soil community, such as heavy tillage, fallowing fields and leaving bare soil, will also interfere with the reciprocal relationships and processes that support a plant's efficient use of nutrition and water. Understanding the biological consequences of chemical applications helped Kempf solve the mystery of the mildewy melons. The cantaloupes' high-input regimen altered interactions between plants and their microbe neighbors in a way that stymied processes essential for the crop's viability,let alone its full, round, sweet, orange-hued cantaloupe-ness . Kempf concluded that there was no way to get a good crop while using chemicals that destroy soil organisms. And that trying to cultivate plants this way was a matter of squandering perfectly good time, money, and water.

Stephenson Soil & Water District's Well Water Testing Program

COMPONENTS	TESTS FOR:	COST
Nitrate Package	Tests for nitrate, nitrite, ammonia, chloride, sulfate, fluoride, soluble phosphorus, silica, and conductivity	$30.00
Metals	Includes antimony, arsenic, barium, beryllium, cadmium, chromium, lead, selenium, aluminum, copper, iron, manganese, zinc, nickel, sodium, calcium, strontium, cobalt, magnesium, potassium, silica, and vanadium	$80.00
****Bacteria**	PurTest Bacteria self testing kit is available from the District. ****Note**: **this is not part of the regular testing components; this is a home self test kit.**	$20.00

Kits will be available for sale, Monday September 20 – Friday September 24 from 7:00 A.M. to 3:30 P.M. We will be selling kits from the entryway of the building due to COVID-19 restrictions. Please call 815-235-2141 extension 3 if we are not in the entryway and we will come out and assist you. A personal check would be the best method of payment, so we do not have to deal with making change.

Confidential report containing test results will be mailed directly to you within 4 to 6 Weeks.

Nitrates in Drinking Water

Nitrates And Diet

Nitrate (NO 3) is a compound of nitrogen and oxygen found in nature and in many food items in our diet. Generally, the concentration of nitrates in the ground water is low. The main adult human intake of nitrates is from food rather than from water. Vegetables such as spinach, lettuce, beets, and carrots contain significant amounts of nitrate. Drinking water normally contributes only a small percentage of our total nitrate intake.

Nitrates In Drinking Water

Although low levels of nitrates may occur naturally in water, sometimes higher levels, which are potentially dangerous to infants, are found. Illinois has adopted a drinking water standard for nitrate of 10 milligrams per liter (10 mg/L) as N (nitrogen). This standard is mandatory for public water supplies and is used as a guide for private water supplies. The U.S. Environmental Protection Agency also uses 10 mg/L as N as a mandatory national standard for public supplies under the Safe Drinking Water Act. The 10 mg/L standard expressed as nitrogen (N) is equivalent to 45 mg/L expressed as nitrate.

Sources Of High Nitrates

It is often difficult to pinpoint sources of nitrates because there are so many possibilities. Sources of nitrogen and nitrates may include runoff or seepage from fertilized agricultural lands, municipal and industrial wastewater, refuse dumps, animal feedlots, septic tanks and private sewage disposal systems, urban drainage, and decaying plant debris. Geologic formations and direction of ground water flow also may influence nitrate concentration.

Health Problems

High nitrate levels in drinking water pose a health risk to infants because they may cause methemoglobinemia, a condition known as “blue baby syndrome.”

High nitrate levels interrupt the normal body processes of some infants. Nitrate becomes toxic when it is reduced to nitrite, a process that can occur in the stomach as well as in the saliva. Infants are especially susceptible because their stomach juices are less acidic and therefore are conducive to the growth of nitrate-reducing bacteria. (Adults can consume large quantities of nitrates in drinking water or food with no known ill effects; their stomachs produce strong acids that do not promote the growth of bacteria that convert nitrate to nitrite.) Nitrite in the blood combines with hemoglobin to form methemoglobin, which reduces the capability of the blood to carry oxygen to all parts of the body. This results in the “blue” condition of the baby’s skin.

Infants younger than 6 months of age are most susceptible. However, because of individual differences in infants, some may not be affected. If an infant is affected, the skin turns a blue color, similar to the color of the blood vessels located close to the skin. If a parent or other caregiver observes this condition, medical help should be sought immediately. The infant is being asphyxiated because oxygen cannot be transported by the blood. Prompt medical attention normally results in quick recovery of the infant.

In all cases where drinking water contains more than 10 mg/L of nitrate as nitrogen, an alternative source of water should be found for the infant. Boiling the water will not reduce the nitrate concentration; in fact, it actually INCREASES the concentration by evaporating off the water and leaving the nitrates behind. Water that is high in nitrates should not be used for preparing infant formula or in any other way that could result in consumption by a baby.

Testing For Nitrate

Federal and state regulations require the testing of public water systems for nitrates; however, high nitrate concentrations can occur in private water wells. If infants will be consuming water from a private water well, the water should be tested for nitrates as well as for bacteria. To arrange for bacteriological and nitrate analyses of your drinking water or if you have questions concerning safe drinking water, contact your local health department or the Illinois Department of Public Health regional office located in Rockford, IL.

Illinois Department of Public Health, Division of Environmental Health, 525 W. Jefferson St., Springfield, IL 62761, 217-782-5830, TTY (hearing impaired use only) 800-547-0466. Questions may be directed to your local health department, to one of the Illinois Department of Public Health regional offices or to the Department’s central office in Springfield.

20 Ways to conserve water at home: A room-by-room guide

Conserving water at home protects the environment and energy-efficient solutions and appliances can save you money on your home insurance policy. Read on to discover 20 ways to conserve water at home.

Kitchen:

1. Run a full dishwasher instead of handwashing (saves 110 gallons/week)

Energy Star-certified dishwashers are 30% more water-efficient than other models. Pre-washing dishes isn't required with most modern dishwashers, so skip this step to save even more water when you wash.

If you ditch handwashing and run full loads of dishes instead, you can save 7,000 gallons of water annually. You'll also get back time and energy to spend on another post-dinner activity.

2. Compost to reduce disposal use (saves 21 gallons/week)

Save water in both your kitchen and your lawn by composting kitchen scraps at home. Eggshells and leftover vegetables can skip the garbage disposal and go straight to your compost bin instead (no faucet required).

Composting is a fully customizable, at-home project, and the end result is a healthy soil feeder for your plants. This crumbly topsoil increases the water holding capacity of sandy soils, ultimately requiring less water for your yard or garden bed.

3. Reuse cooking water (saves 105 gallons/week)

Rather than tossing pasta or cooking water after use, reuse it for your next batch of cooking or water your plants with it instead! Pasta water is especially safe to save and reuse, and adds complexity and richness to your noodles.

You should also save the water you use to wash fruits and vegetables during food preparation. This water makes great plant food for indoor plants or your garden bed.

4. Steam rather than boil vegetables (saves 42 gallons/week)

Steaming your vegetables saves water and makes your vegetables more nutrient-rich. This is because boiling water causes nutrients to leak out, making your veggies less healthy in the process.

5. Soak rather than rinse your pots and pans (saves 147 gallons/week)

For items too big or dirty to make it into the dishwasher, skip the rinse and soak them to remove food buildup and stains. Rinsing your pots and pans requires running water, which can waste 147 gallons of water per week.

Bathroom

6. Take quick showers rather than baths (saves 315 gallons/week)

Bad news for tub enthusiasts: a full bath uses up to 70 gallons of water. On the other hand, short showers can cut up to 45 gallons of that waste. Please, by all means, keep rinsing off — just replace that 30-minute soak with a 10-minute shower.

7. Turn off the faucet as you brush (saves 70 gallons/week)

While brushing your teeth twice a day is important (and we can't emphasize this enough), turning the faucet off during your teeth cleaning can save 10 gallons of water per day. Use a cup, rather than your hands, to rinse your mouth out once you've finished brushing to save even more water.

8. Only flush when necessary (saves 63 gallons/week)

Did you know that the average American uses the most water when flushing the toilet each day? Experts recommend only flushing number 2, but if that doesn't fit your comfort level just avoid discarding random items down the toilet. Stick to human waste and toilet paper.

9. Install a high-efficiency toilet (saves 490 gallons/week)

Older toilets use anywhere from 3.5 to 7 gallons of water per flush. If you're flushing 10 times a day, that's up to 70 gallons of water per day from your toilet alone. Installing a high-efficiency toilet cuts this water use down to 1.28 gallons or less per flush.

20 Ways to conserve water at home: A room-by-room guide (article continued from page 10)

10. Check pipes and appliances for leaks regularly (saves 105 gallons/week)
Don't waste 105 gallons of water on leaky bathroom appliances. These appliances or pipes leaks are a major waste of water, and the worst part is that you're not aware you're using it.

Laundry

11. Use cold water for your washes (saves 90% of energy)
Ninety percent of energy during the laundry process is used heating the water. Opting for cold water whenever possible, and warm when some heat is necessary, will save on energy costs.

Turning down your hot water tank is another good way to conserve energy: Try setting it to 120 degrees or lower. A household can save $40 annually by making the switch from hot to cold water washes.

12. Run full loads (saves 65 gallons/week)
Resist the urge to run a laundry load when you have a few dirty items. Running full loads instead of half loads can save 3,400 gallons of water annually, according to the EPA. This habit also requires less work and time in the laundry room.

13. Reuse towels before washing (saves 164 gallons/week)
Reuse bath and hand towels two or three times before tossing them in the laundry, hanging them to dry in between washes. Blue jeans are another item that doesn't need to be constantly washed. In fact, they'll likely last longer the less they see the machine.

14. Upgrade your appliances (saves 250 gallons/week)
A household saves $380 per year by upgrading to Energy Star and/or WaterSense appliances, plus sometimes rebates are available. Take the laundry room, for example. Energy-efficient washers can save up to 7,000 gallons of water per year. High-efficiency water heaters use up to 50 percent less energy.

15. Hang your clothes on a drying rack (saves 6% of energy)
Saving energy saves water, too. Hanging your clothes is a great way to both limit your dryer usage and prevent shrinkage.

Outdoors

16. Maintain your irrigation system (saves 146 gallons/week)
Up to 50% of outdoor home water use is lost due to wind, evaporation and runoff caused by inefficient irrigation methods. Save up to 146 gallons of water per week by checking on your irrigation system monthly.

You should also adjust your irrigation schedules depending on the time of year, running sprinklers less frequently in the winter months. Another trick is to run your sprinklers in the morning to lose less water to evaporation.

17. Plant native and drought-tolerant plants (saves 110 gallons/week)
Spend less time and energy watering your lawn by making smart plant purchases. A little bit of research can go a long way to find the best native and/or drought-tolerant plants.

Drought-resistant plants, such as aloe and geranium, can survive with less rainfall and watering. Native plants are already accustomed to the climate and natural rainfall. While you'll still need to maintain them, they should require a lot less work than exotic plant species.

18. Add mulch to your garden or lawn (retains 80% of water)
Mulch is another great way to conserve water in your yard, because it prevents evaporation and weed growth by helping plants hold their moisture. Compost, wood chips and straw are three popular mulches for moisture retention and can help reduce evaporation from soil by up to 70%.

19. Use a broom to clean driveways and sidewalks (saves 1,050 gallons/week)
Skip the hose and grab a broom next time you clean your driveways and sidewalks. This small maintenance task can save up to 150 gallons of water every cleaning. Due to its effectiveness, some cities, such as Los Angeles, have required broom cleaning by law during droughts.

20 Ways to conserve water at home: A room-by-room guide (article continued from page 11)

20. Collect rainwater in a barrel (saves 21 gallons/week)
Harvesting rainwater is a natural irrigation method that collects rain in a barrel for you to reuse on your yard or garden. Some states, such as Texas and Rhode Island, even offer a tax incentive. Other states have particular laws about the practice, so make sure to do some reading before you collect.
Another important reminder is that rainwater harvesting can pose a health problem if the water is consumed, so always keep your barrel somewhere safe from small children and pets.

Adopting small habits can have a big impact on your water footprint. And conserving water at home isn't just good for the planet, but for your wallet, too. You can save an average of $140 on your water bill each year by reducing your water consumption to less than 1,000 gallons per month.

Energy-efficient upgrades often pay for themselves in less than a year through your water and electricity bills, and they can also reduce your monthly home insurance premiums.

Sources:
Energy.Gov | EPA | National Geographic

Septic System Failures

When septic systems do not function properly, humans may come into contact with wastewater that contains disease organisms and other harmful substances. Failure of the system can be caused by lack of proper maintenance, overuse of water in the household or improper design of the septic system.

Indicators of a failing system include a sulfur or rotten egg smell in the vicinity of the system or indoors, water and possibly solids surfacing in the drain field, or sewage backing up in the house. Well water tests showing high levels of nitrates or coliform bacteria may also be an indicator.

Solids that build up in the septic tank must be removed periodically. If this build up is not pumped out, solids will enter the drain field and plug it up. Costs for drain field replacement is usually several thousand dollars. Costs for pumping out a septic tank typically run around $150-$300. It is recommended that septic tanks be pumped out at least every three years.

Overuse of water is a common problem. Septic systems are designed to handle a certain amount of water each day, usually depending on the number of people living in the house when they system was put in. Such things as a family of four moving into a house with a septic system designed for one or two people will cause a premature failure. Other overuses of water include leaking toilets or faucets or doing more than three large loads of laundry per day.

Improper design can occur when the wrong type of system was installed. Soil conditions, high water tables, and use of a garbage disposal must be considered when a system is put in.

Maintained septic systems will be trouble free for many years. Following a good water conservation and tank cleaning program will assure this happens.

Article by: University of Illinois Extension

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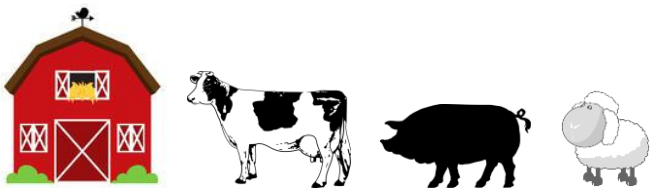

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STEPHENSON SOIL AND WATER CONSERVATION DISTRICT
2021 FALL FISH ORDER FORM

Name _____ Phone _____ Email: _____

Address_____ City _____ State, ZIP _____

SPECIES (*Stocking Rate*)	SIZE	PRICE	UNIT	QUANTITY	TOTAL PRICE
Channel Catfish (*150/acre*) - *Sport fish. Mix with Hybrid Sunfish & Largemouth Bass.*					
Channel Catfish	4-6"	$ 0.70	each	ea.	
Channel Catfish	6-8"	$ 0.85	each	ea.	
Largemouth Bass (50/acre) - *A predator; helps control bluegill and crappie populations.*					
Largemouth Bass	3"	$ 1.15	each	ea.	
Hybrid Bluegill -					
Hybrid Bluegill	2-3"	$ 0.55	each	ea.	
Hybrid Bluegill	3-5"	$ 0.95	each	ea.	
Bluegill - *Prolific in ponds. Stock with Largemouth Bass.*					
Bluegill	2-3"	$ 0.55	each	ea.	
Bluegill	3-5”	$ 0.95	each	ea.	
Black Crappie - *Good in large clear vegetated lakes/ponds. Prolific. Stock with Largemouth Bass.*				Not Available this sale	Not Available this sale
Redear	3-4"	$ 1.00	each	ea.	
Fathead Minnows *(5 lbs./acre)* - *Stock in new ponds before Largemouth Bass.*	1-3"	$ 11.25	per/lb.	lb.	
** Grass Carp *(5-10 each/acre)* - *Alternative to using chemicals for weed control. Aquatic plants should not be totally eliminated.*	8-11”	$ 12.50	each	ea.	

**** REQUIRED PERMIT INFORMATION FOR GRASS CARP ORDERS**
POND LOCATION: TWP _____ SECTION _____ T_____ R_____ POND SIZE _____ ACRES

ORDER TOTAL $_____

ORDER DEADLINES: Grass Carp & Other Fish: Friday, *August 27, 2021*

DELIVERY: **11:00 a.m., Wednesday, September 15, 2021**

USDA/SWCD Office parking lot, 1620 S. Galena Avenue, Freeport, IL

Pick-up will be drive through; please line up when arrive and remain in your vehicle.

PAYMENT: Please include payment with your order; checks payable to Stephenson SWCD.
If payment is made in person you will need drop your form and check in the box marked NRCS/SWCD located in the entryway as the door entering the building is locked due to COVID-19 regulations.
MAILING ADDRESS: 1620 South Galena Avenue, Freeport IL 61032 815-235-2141 ext. 3

ESSENTIAL INFORMATION

All fish *will be bagged* and sealed in oxygenated water.
A 5 gallon bucket or something similar to support the bags is recommended.

Water cannot be furnished.

CHANNEL CATFISH

The Channel Catfish has an olive and brown to dark blue body, back not humped, deeply forked tail, and their anal fin has a curved margin. A Channel Catfish can grow up to 58 lbs., however in most farm ponds they will only reach 5 to 10 lbs. Spawning will occur in cavities in hollow logs, holes in undercut banks and beneath rocks when water reaches 70-75 degrees. Stocking rate 100-200 per surface acre.

LARGEMOUTH BASS

Largemouth Bass have a jawbone that extends beyond the back of the eye and the two dorsal fins are nearly separated or deeply notched. The Largemouth Bass can grow up to 20 lbs., however the typical weight is 1 to 6 lbs. These bass are usually found in moderately clear to turbid, quiet warm waters in streams, rivers, lakes, reservoirs and ponds, around vegetation and near logs, trees, brush, and stumps. Largemouth Bass usually spawn when water temperatures reach 63-68 degrees. Stocking rate 100-200 per surface acre.

HYBRID BLUEGILL

The Hybrid Bluegill is a cross between a Green Sunfish and a regular Bluegill. These fish are similar to a regular Bluegill, however they grow at a quicker rate and get a larger size. The Hybrid Bluegill are more aggressive than the regular Bluegill because of the Green Sunfish mix in them. Hybrid Bluegill will reproduce however they are 90 to 95 percent male. A Hybrid Bluegill can grow up to 4 lbs.; however typically they get only 1 1/2 to 2 lbs. Stocking rate 600-1,000 per surface acre.

BLUEGILL

The Bluegill is a deep bodied, slab-sided fish with a small mouth and has a black spot on soft dorsal fin and flexible black ear flap. A Bluegill can grow up to 4 lbs., however they are usually 1 lb. or less. The Bluegill will congregate around vegetation and sunken trees of shallow backwater bays, lakes and ponds. Spawning occurs when water reaches 67 to 70 degrees in shallow areas over sand and gravel. The usually nest in colonies and spawn once every 28 days during the spring and summer. Stocking rate 600-1,000 per surface acre.

REDEAR SUNFISH

The Redear, also known as a Redear Sunfish or Shellcracker, is dark olive above, yellow to green on the sides, and has white on the belly. They also have a red edge on the gillcover on the male and orange on the female. Redear can grow up to 4 lbs., however most commonly they average about 1-1 1/2 lbs. Redear prefer the bottom of clear, quite waters with moderate vegetation. They will spawn when water reaches 60-70 degrees in deeper waters and they nest in colonies. Primarily a Redear will eat snails and clams, but they will also eat insect larvae, small crustaceans, and insects. Stocking rate 600-1,000 per surface acre.

GRASS CARP

The GrassCarp is a plant-eating fish that is native to China and Russia. It can grow up to 60 pounds and live 15-20 years. Although it is a relative of the common Carp, it neither acts nor looks like the common Carp. The Grass Carp is occasionally caught on hook and line and some anglers think it tastes better than the common Carp. Grass carp grow rapidly and prefer to feed on rooted vegetation, although after five years of age, both their growth rate and their effectiveness at controlling aquatic plants slow considerably. Stocking rate 10-12 per surface acre.

FATHEAD MINNOWS - stocking rate 3,000 -5,000/ 12-20 lbs. per surface acre

Fathead Minnows should be stocked in new ponds. They should be stocked prior to stocking Largemouth Bass so they have an opportunity to spawn and provide plenty of feed for the young bass.

BLACK CRAPPIE

The Black Crappie does well in clear vegetated lakes or ponds. It feeds largely on small fish as an adult but still relies heavily on insects and crustaceans. This species is extremely prolific; a female may produce from 10,000 to 180,000 eggs. Largemouth Bass should already be present or stocked to control their populations. NOT RECOMMENDED FOR SMALL PONDS. Stocking rate: 100 per acre, 1-2 inch fish.