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| Logo, company name  Description automatically generated | Pocasset Water Quality Coalition *White Paper***Fertilizers – Significant Sources of Nitrogen Pollution** *May 2023* |

*This is one in a series of White Paper documents created to help educate PWQC members on the issues with and in our saltwater. The PWQC Board of Directors, using research from our friends at Barnstable Clean Water Coalition, Buzzards Bay Coalition and the Association to Preserve Cape Cod, wants to share what we have learned.*

As outlined in the **White Paper 2 on Nitrogen**, one of the major contributors to the deterioration of the water quality of Hen Cove (and other bodies of water in the Red Brook/Pocasset Harbor watershed) is the increasing presence of nitrogen and phosphorous leeching into the water. High levels of nitrogen can cause eutrophication of salt water, resulting in algae bloom and “dead zones” which choke out aquatic life (like species of shellfish and eel grass), in addition to producing toxins that may also be harmful to humans.

**How does Nitrogen get into the water**

The increase in the nitrogen concentration of Hen Cove can be attributed in large part to the use of nitrogen-based fertilizers by homeowners on their lawns and gardens (and golf courses, too!). These fertilizers are part of stormwater runoff flowing into the cove, as well as seeping through down the “Sagamore Lens” (an underground hill-like formation impacts the flow of groundwater into the underground aquifer and into our coves).

**What is in fertilizer and why is it an issue**

The principal active components of most commercial fertilizer products are nitrogen, phosphorus, and potash, which are present in both granular and liquid formats.

Some granular fertilizers used by homeowners and professional lawn care companies are designed to break down and dispense nitrogen more quickly into the soil.

When lawns and gardens are watered heavily or rained upon soon after application, these quick-release fertilizers can wash onto nearby streets and driveways, and more quickly move into adjacent bodies of water.

In addition to the surface movement of nitrogen via driveways and streets, the increasing concentration of nitrogen in groundwater can migrate toward and eventually seep into our salt-water areas.

**What can I do**

Some slow-release fertilizers take longer to break down and become absorbed into the soil. These fertilizers are designed to dispense nitrogen more gradually, feeding lawns and gardens at a slower rate, providing nourishment to lawns and garden areas over a longer time.

Liquid fertilizers consist of roughly the same composition of nitrogen and phosphorous as granular fertilizers. Because liquid fertilizers are applied by spraying, by their nature they generally behave as quick release fertilizers. Liquid fertilizers that are intended to be immediately absorbed into lawns and gardens must be applied more frequently to provide the same measure of fertilization as granular products.

Overall, most commercial fertilizers contribute significantly to the nitrogen pollution of our saltwater resources, but **approaches are available** to help reduce the nitrogen pollution from fertilizer, as well as **alternative substitutes** for nitrogen-based fertilizers.

**Alternatives for Mitigating Nitrogen Pollution from Fertilizer Use**

There are several strategies that can help reduce the nitrogen from fertilizers going into Hen Cove and other nearby saltwater estuaries. These include:

* Substituting natural **organic fertilizers** for nitrogen-based products,
* Using **fish-based** **soil conditioner products**, and
* **practicing recommended** **fertilizing techniques** that limit the migration of granular fertilizer accidentally into our nearby watersheds.

**Organic Fertilizers**

**Organic fertilizers** offer a source of nutrients for our lawns and gardens without the high concentration of nitrogen and phosphorous present in most commercial fertilizer products. Organic fertilizers are fertilizers that are naturally produced. Examples of naturally occurring fertilizers include manure, slurry, worm castings, peat, seaweed and guano. Organic fertilizers are biodegradable and will not pollute your yard, soil or the water that runs off your yard. They are a good way to make sure your lawn care is not contributing to water pollution.

**Synthetic lawn fertilizers**, on the other hand, wash away with excess watering or during rains polluting ponds, rivers, lakes, and oceans. The leached minerals from chemical fertilizers are linked to eutrophication of waterbodies.

With synthetic fertilizers so plentiful and inexpensive it might make a person wonder if it is important to use organic products instead of synthetic. With organic lawn care, the **overall health of the soil and grass is the main goal**. Improved soil leads to less run-off ending up in our waterways. So, while chemical fertilizers may do the job today, organic fertilizer ensures the health of lawns for the long run and protect our water.

Homeowners can help by being careful which products you or your lawn care service utilize to maintain the health of your lawn. By choosing to incorporate organic practices into your lawn care maintenance or by purchasing lawn care services from companies using organic products, you can help limit the amount of nitrogen and phosphorus that run into our local waterways.

**Other Alternative Products and Fertilizing Techniques**

Use appropriate fertilizing, mowing and watering techniques that can help reduce the release of nitrogen from granular fertilizers, including:

1. Limit fertilizer use – do not fertilize immediately before or during a heavy rain; use fertilizer sparingly (during spring and fall when it can be readily used by lawns); never use fertilizer near bodies of water or watercourses.
2. Do not over-water your lawn or garden – excess watering may spread nitrogen before it can be absorbed into the soil.
3. Avoid spreading granular fertilizer on paved surfaces; sweep loose granular fertilizer off driveways and streets to prevent it from becoming part of water runoff into adjacent watersheds.

Generally, many “Cape Cod” lawns endure without fertilizer and with very little water. Recycling grass clippings returns natural nutrients to the soil; this is often all that is needed for established lawns.

**Fish-based plant probiotics, soil conditioners and liquid fertilizers** (such as ***Fish Brew***, produced here on the Cape)have been developed and introduced as soil treatment products and are available commercially to homeowners and lawn care companies in liquid form. These products support micro bacterial growth at the plant or grass roots, which then naturally provide nitrogen to the plant without adding direct nitrogen into the waste stream. These products can be sprayed on lawns or gardens (like liquid fertilizers) and are credited with significantly improving the health of garden plants or high-end turf for sporting activities and homeowner uses.

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