KEEP THE "P" OUT OF LITTLE BITTERROOT LAKE

Little Bitterroot Lake Association (LBLA) Newsletter No. 2 March 2021

Lake Education and Awareness Program (LEAP) 

TRY TO AVOID USING ANY FERTILIZER NEAR OUR LAKE

Please, if you must – "ONLY" use PHOSPHORUS FREE FERTILIZER

LAWN AND PLANT FERTILIZERS CONTAINING PHOSPHORUS IN THEIR CHEMISTRY ARE HARMFUL TO LITTLE BITTERROOT LAKE. PHOSPHORUS IN FERTILIZERS WASHES OFF FERTIILIZED LAWNS AND PLANTS OF LAKE PROPERTY OWNERS AND IS LEACHED INTO THE LAKE.

HARMFUL EFFECTS OF PHOSPHORUS OVERLOADING OUR LAKE FROM FERTILIZERS

1. Aquatic plants absorb dissolved nutrient Phosphorus like it is sugar laced dessert. 1 pound of Phosphorus can produce 500 pounds of blue green algae, and result in unwanted algal blooms.
2. A sharp decline in water clarity results.
3. Algal blooms and accelerated growth of other aquatic plants in the lake dramatically decreases oxygen levels in the lake which is harmful to fish and other animals which inhabit the lake.
4. Unwanted fish and bacteria thrive in Phosphorus polluted low oxygenated lake water.
5. The lake becomes less desirable for recreational purposes such as swimming, boating, and fishing.

PROACTIVE MEASURES PROPERTY OWNERS CAN TAKE TO KEEP PHOSPHORUS OUT OF LITTLE BITTERROOT LAKE

1. If you must…Use Phosphorus free (w/Slow-Release Nitrogen) fertilizer.
2. Use fertilizer as directed in small amounts being sure to not over fertilize.
3. Do not fertilize directly by the lakeshore.
4. Limit the number of times you fertilize to once/year or not at all.
5. Best time to fertilize is in spring around Easter or fall; a couple of weeks after Labor Day.
6. Plant bushes and shrubs close to the lake to decrease and slow the flow of water runoff.
7. Remove grass clippings and other decomposing organic material close to the lake.
8. Encourage like friends and neighbors to buy Phosphorus Free (w/Slow-Release Nitrogen) fertilizer.
9. Encourage local stores with fertilizer to stock Phosphorus Free (w/Slow-Release Nitrogen) fertilizer.

FERTILIZER NUMBERING-A ZER0 in the middle means phosphorus free!

BUY "ONLY" PHOSPHORUS FREE with Slow-Release NITROGEN!

KEEP READING PLEASE…REALLY GOOD INFORMATION

The "P" stands for phosphorus. It is one of the most polluting substances in lakes across the United States and is a serious potential threat to Little Bitterroot Lake. Presently, phosphorus levels in Little Bitterroot Lake are stable, but with leaking septic systems, new development of property surrounding the lake, large tracts of "disturbed bare land", excessive invasive noxious weeds, and overuse of phosphorus in fertilizers on grasses and other plants, the threat to Little Bitterroot Lake becomes very real. If we educate ourselves, and care about keeping Little Bitterroot Lake clean and pristine, and act proactively we can contain the potential hazards of phosphorus pollution in our lake. *This short essay will give the reader a basic, easy to understand approach about fertilizers and their dangers to the lake in what is actually a very complicated complex bio-chemical subject.*

Most property owners try to eradicate and control invasive noxious weeds and replace them with grasses and other plants. These plants need nutrients for their survival. There are many nutrients found in the natural ecosystem, but the most important ones for healthy plants are in the form of Nitrogen (nitrates, nitrites, ammonia), Phosphorus (phosphates), and Potassium (apatite, potash). *Nitrogen (N)* is used by plants in a process called photosynthesis to produce chlorophyll, which aids in plant growth and greens up lawns, and for aquatic plants nitrogen makes the water look green. *Phosphorus (P)* is important in the development of healthy roots and is also important during seeding. *Potassium (K)* aids in the general health of plants, the formation of chlorophyll, and in disease immunity. In small quantities these nutrients are good for the overall health of the Little Bitterroot Lake ecosystem. Environmental problems in the lake begin when fertilizers containing excessive amounts of these nutrients end up in the lake.

Nitrogen, phosphorus, and potassium are the most important ingredients in any fertilizer. If the proper fertilizer is selected and used in small amounts, they may have a low impact on the lake, but over fertilization of grasses and plants can have devastating environmental effects on any lake, including Little Bitterroot Lake. The pollution problems created by fertilizer used by unknowing property owners around Little Bitterroot Lake could be catastrophic to the environmental integrity of the lake.

The following is a worst-case scenario for a future Little Bitterroot Lake

Dissolved nitrogen and phosphorus in fertilizers are leached from fertilized grass and plants from rain and snow melt into the lake. Soluble phosphates containing phosphorus is also released into the soil from the decomposition of grasses and other plants, then leached into the lake by rain and melt water from snow. Aquatic plants which include blue green algae and invasive noxious Eurasian watermilfoil absorb these nutrients into their cells providing growth and other important plant functions. The environmental problems involving phosphorus, begins when the lake becomes over-loaded with intolerable levels of dissolved phosphorus (phosphate, PO4). Aquatic plants absorb dissolved phosphorus like sharks in a food frenzy. The result of this pollution produces blue green algal blooms and a proliferation of all aquatic plants in the lake. It is estimated that one pound of phosphorus can produce about 500 pounds of blue green algae! The lake becomes eutrophic, that is

the lake is over saturated with nutrients, especially phosphorus. When a lake is in the eutrophic state, aquatic plants deplete dissolved oxygen to very low levels resulting in negative unwanted shifts to the natural aquatic plants and animals which inhabit the lake. If the phosphorus pollution is extreme natural desired species rapidly decline or disappear from the lake while undesirable species thrive. Water clarity would greatly decrease taking on an unhealthy green appearance along the shoreline. Fish would often be seen belly-up in the water, dead or fighting for oxygen. In addition, once a lake is heavily polluted with phosphorus it is extremely difficult to get phosphorous levels back to normal, often showing phosphorus pollution retention periods greater than fifteen years!

Is this what we want for Little Bitterroot Lake? The answer is an obvious - NO. Can Little Bitterroot Lake realistically change like the lake depicted above? This is a scary - YES. Water quality monitoring of Little Bitterroot Lake by Water & Environmental Technologies since 2004 shows that although phosphorus levels in Little Bitterroot Lake are presently low and stable, nitrogen levels have "significantly risen" since 2012. Nitrogen levels in the lake are presently high enough for rapid algae growth in the lake, but by itself probably will not produce algal blooms, even with more additions of nitrogen. There is also a relationship between nitrogen and phosphorus concentrations. Increased nitrogen levels in Little Bitterroot Lake have not yet produced large algal blooms and by itself probably will not, but if phosphorus levels increase as nitrogen levels continue to increase, a tipping point will soon be reached limiting any further addition of phosphorus to the lake. The lake becomes what is termed a "phosphorus limited lake". Little Bitterroot Lake is presently phosphorus limited. Increased concentrations of nitrogen in the water decreases the amount of phosphorus the lake can hold to reach its tipping point limit and any increase in phosphorus could directly cause algal blooms in the water to explode. Oxygen levels in the lake would also decrease (eutrophication) having negative effects on the lake. **Little Bitterroot Lake is approaching that limit**.

What can individual property owners <u>proactively</u> do to decrease or at least help stabilize increased phosphorus in Little Bitterroot Lake? One very important thing we all could do to help in this serious developing problem would be to choose the correct fertilizer to use when fertilizing property. <u>Choose a 0 % phosphorus free</u> <u>fertilizer</u>. The way you can tell if the fertilizer is phosphorus free is by the 3 numbers on the label on the fertilizer bag. For example: 20 – 0 - 5. These numbers indicate the % by weight of the nitrogen (N), phosphorus (P), and potassium (K) in the bag of fertilizer. In this example, a 100-pound bag of fertilizer would have 20 pounds of N, <u>0 pounds of P free</u>, and 5 pounds of K in the fertilizer. The middle number needs to be <u>zero</u>. <u>REMEMBER: USE PHOSPHORUS FREE FERTILIZER.</u> The remaining 75 pounds would be inert filler ingredients.

What else can we do to protect Little Bitterroot Lake? Use fertilizer in small amounts as instructed. Fertilize less by the lake – better yet **<u>DO NOT fertilize by the lake</u>**! Limit the number of times per year in which you fertilize to once per year or in some years not at all. The best time of year to fertilize is around Easter (spring) or shortly after Labor Day to October (fall). Avoid fertilizing in summer. Try to purchase organic insoluble nitrogen fertilizer that is phosphorous free because they decompose into soluble plant nutrients much slower than soluble chemical nitrogen fertilizers. Plant bushes and shrubs close to the lake to decrease and slow the flow of water runoff. Remove grass clippings and other decomposing organic plant material because it decomposes into soluble phosphorus phosphate harmful to the lake. Encourage your lake friends and neighbors to buy phosphorus free fertilizer.

Encourage agricultural/country stores or other stores which sell fertilizer to stock phosphorus free fertilizer to help protect and save our area lakes from the dangers that phosphorus pollution creates.

In summary, there are many environmental issues attacking Little Bitterroot Lake. Phosphorus in fertilizers is a serious problem that we as individual property owners can eliminate and control if we proactively select and properly use phosphorus free fertilizer when using fertilizer on our property. Knowledge and awareness of these environmental issues is important if we expect to make a cohesive proactive plan to protect Little Bitterroot Lake. Why should we wait for Little Bitterroot Lake to suffer the same environmental problems that so many lakes in the Midwest and Eastern United States have been affected by? **Avoid fertilizing. If you must fertilize make the right choice: use phosphorus free fertilizer (with slow-release nitrogen).**

SOURCES OF INFORMATION FOR GREATER DETAIL

1. Little Bitterroot Lake Water Quality Monitoring Program 2020 Annual Report, Water and Environmental Technologies, Butte, Montana
2. The Montana Lake Book, 3rd Edition, 2017, Whitefish Lake Institute
3. Ted Peters, Director, Geneva Lake Environmental Agency (GLEA), Phosphorus Free Fertilizer, 2009

ALL HANDS-ON DECK  CONTRIBUTION FORM

PLEASE DETACH AND MAIL BACK

TO: LBLA PO BOX 1003 MARION, MT. 59925

NAME_____ **CONTRIBUTION AMOUNT** _____

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