APRIL 15 – 30, 2019 NATURAL HISTORY NOTES
By Dick Harlow

CLOVER – NITROGEN FIXING

Plants that have nodules attached to their roots which enlarge as the plant grows are called legumes. These attachments, called nodules, contain bacteria that can remove or fix atmospheric nitrogen. Fixing atmospheric nitrogen means taking nitrogen, N_2, out of the air we breathe, and chemically forming ammonia, NH_3, in the cells of the bacteria. This ammonia is now able to be absorbed by plant tissue. All plants release some nitrogen into useable form when they decay.

All proteins have as a common chemical the atom nitrogen. However, plants and animals can't use atmospheric nitrogen; it has to be combined with other gases such as hydrogen or oxygen before a plant or animal can use the absorbed nitrogen atom.

Red Clover, *Trifolium pratense,* © Dick Harlow

Legumes are very important to agriculture for returning nitrogen to the soil that is lost when these plants are eaten by livestock, or wild herbivores, e.g. deer, rabbits.

All plants and animals require nitrogen to form protein. Protein is found in every cell of our body. All life requires protein; it is considered the building block of life. Therefore, any plant that can transform nitrogen gas from the atmosphere into a useable form of nitrogen that life can then use and convert to protein is very significant.

It is amazing how interconnected we all are to each other!

White Clover, *Trifolium repens*, © Dick Harlow

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OK, let's remove one myth. Planting a nitrogen-fixing plant like Red Clover next to one that doesn't fix nitrogen like (e.g. field or meadow grass), doesn't mysteriously attach nitrogen or ammonia to the non-nitrogen fixing plant. The non-fixer has to get its dissolved nitrogen from the nitrates in the soil, not from the nitrogen fixer. The only way other plants can receive the nitrogen they need is from ammonia from animal urine or from decaying manure. Non-nitrogen fixing plants have to absorb their nitrogen from this source. This is why we have fertilizers with soluble nitrogen in them and manure from animals that also has nitrogen in it. Decomposition returns nitrates to the soil so that future plants will have a source of nitrogen for protein production.

Some of the legumes that are useful to agriculture and can be seen here at EastView growing in our lawns and fields are: White and Red Clovers, Alsike Clover, White and Yellow Sweet Clover,

Alsike Clover, *Trifolium hybridum*, © Dick Harlow

Notice that the clover above looks like it could be a cross between white and red clover. Any clover that is white at the end of its blooms and red at its base is most probably Alsike Clover.

Two of my favorites are White and Yellow Sweet Clover. Not only because they are pleasant on the eyes with their multiple stems of white and yellow flowers, but also because they are called "honey plants". Along with the sweet odor they exude, bees love them for their nectar. If you like honey you will be rewarded with honey that comes from Yellow or White Sweet Clover!

One of the first things I noticed when we first moved to EastView were the number of clovers growing in the uncut fields. These clovers, unfortunately, were out-competed by other plants in some areas; but still they have held on at EastView through this particular note date.

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White Sweet Clover, *Melilotus* albus, © Dick Harlow

Both White Sweet Clover and Yellow Sweet Clover have European ancestry. However, they are now found throughout North America and subtropical temperate areas.

White Sweet Clover is also known as the Honey Clover and considered a valuable honey plant.

Yellow Sweet Clover, *Melilotus officinalis*, © Dick Harlow

Yellow Sweet Clover is a native to Europe and was introduced to North America, Australia and Africa.

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All – Yellow & White Sweet Clover, along with Red, White and Alsike Clovers. © Dick Harlow

I have to include an image of all the clovers in the EastView field between Deer Meadow Drive and the Inn. If you are able to enlarge the image you will see all the clovers. Especially, note the White Sweet Clover in the extreme upper right corner only visible if you are able to enlarge the image.

OBSERVATIONS

MAMMALS
Coywolf – barking/howling
Red Fox – sitting on South Pond berm at dawn.
Gray Squirrel – under bird feeders

Weather Tidbits
Month of APRIL 1-30, 2019

All Measurements taken at solar noon (1230 EST).
PRECIPITATION

Total Precipitation: 120.0 mm or 4.7 inches

Overcast Days: 8