Jottings From The Golf Course Journal

THE WORM MOON

By Monroe S. Miller

Working at Blackhawk Country Club for the past fourteen years has heightened my interest, in a general way, of Indian cultures. I used to keep my eyes open, during spring plowing and planting on our family farm, for Indian arrowheads. They were found quite frequently in southwestern Wisconsin fields and it was a real find when you spotted one. Our Club has preserved many features of Indian society of a thousand years ago, and that effort was recognized by the National Park Service when they declared the Blackhawk group of effigy and burial mounds a part of the list of historic places in America.

A bit of Indian history I've found interesting for a long time has been the Indian calendar. Their terminology was based on weather or natural events and they used interesting names that are easy to relate to — Harvest Moon, Wolf Moon, Cold Moon, and so on. The names, obviously, varied from region to region and from tribe to tribe. What may have been the Snow Moon in New England was Opening Buds Moon for a tribe on the Gulf of Mexico. I like the New England names best, simply because they were ones used by related tribes in the areas where the first English settlers arrived, and they more closely match the seasons in Wisconsin.

The moons approximated the months of the years, as we know them. However, a lunar month (moon) is only 29 days, 12 hours, 44 minutes, 3 seconds and the Moon years of the Indian calendar required a correction Moon every few years, just to make solstices and equinoxes come out right. Below are our months and their equivalent moons on the Indian calendar:

January	*Wolf Moon*
February	*Snow Moon*
April	*Pink Moon*
May	*Flower Moon*
June	*Hot Moon*
July	*Buck Moon*
August	*Sturgeon Moon*
September	*Harvest Moon*
October	*Hunter's Moon*
November	*Beaver Moon*
December	*Cold Moon*

The Corn Moon was occasionally inserted between Sturgeon and Harvest Moon as the correction moon. And the upcoming month of March has an interesting moon, one that is of particular interest to Golf Course Superintendents. It is the WORM MOON.

Spring in New England is commonly and frequently referred to as "Mud Time" and my suspicion is that that reference may also have roots in Indian heritage. At any rate, "melt and mud, and the frost comes out of the ground, the angle worms with it," and the first days of spring are in the WORM MOON.

I heard more conversations about earthworms last year than I had in the previous ten. When I started my career in this business, educational programs occasionally included the topic of earthworms. One of the best I heard was given by Ted Woerhle and I recall it was presented at the Wisconsin Golf Turf Symposium. The subject was addressed from "what can we do to maintain and increase our earthworm populations." Recently, the talk has taken on tones of grumbling. A couple of days prior to the 1985 Wisconsin Turfgrass Association golf outing I remember asking Tom Harrison how he was doing in getting Maple Bluff ready for the tournament. His reply, paraphrasing, was, "Fine, except for all the damn worm casts on some fairways." I had a similar visit with Carl Grassl about what he was doing on greens and tees to suppress earthworm activity at Blue Mound. And they weren't the only ones experiencing some problems with worm casts. We are even going to have the opportunity, at our May meeting at Villa du Parc, to hear Dr. Roscoe Randell from the University of Illinois Department of Entomology address the topic of earthworm suppression.

I would love to have been around our golf course twenty-five or thirty years ago. Because of the five lakes the metropolitan area of Dane County has built around, there are naturally a lot of fishermen. Fishermen need bait. Worms make great bait and are easy money for ambitious kids — the product is free for the taking. The secret was finding a good source, a source that didn't require digging for them. From stories I've heard, Blackhawk was easy pickins'. One of my good sources for this information is Roger Bell — he was a west sider prowling for bait and harvested his share from the golf course.

You can only speculate as to why there were so many earthworms then. My guess is that it simply related to low or no insecticide use, few fungicide applications and probably significant over-watering. This was also a period when sand topdressing was not in vogue — medium to fine textured soils with organic amendments were the rule — and the playing surfaces must have provided an excellent environment for earthworms.

The serious kids that worked to make money had interesting methods of harvest. The normal gear required a metal can tied to each ankle — one for holding the earthworms as you picked them and one to hold grit or lime. The lime was necessary to keep the worms from slipping through your fingers. The method was to dip into the grit can, harvest a handful of worms, put them into the can tied around the other ankle and start all over again. As the ankle can filled, it was dumped into a larger pail. Usually brothers or close friends worked in partnership and contributed to the same larger vessel. One other piece of equipment common to the worm harvesters was a spelunkers helmut — there were no free hands to hold a flashlight. A small team could, in a relatively short period of time in a night, harvest tens of thousands of earthworms for sale as bait. It sounds like it was quite a system, and a successful one as well.

The thing that amazes me is that it seemed impossible for them to over — harvest. This went on all summer long, summer after summer. The earthworm population started a rapid decline in the late 60's/early 70's, and that correlates exactly to some significant management changes on our golf course. Why weren't there serious

worm cast problems before then, considering the number of earthworms that were present beneath the surface? Is the worm casting related to the height of cut — it seems particularly logical on fairway turfs. Was this heavy harvest of earthworms from greens and tees enough to check populations to a level where casts weren't significant? There is no doubt that chlorodane had an effect on their numbers, but what about the new generations of insecticides with such short periods of residual activity? There are a lot of more unanswered questions. The thing that strikes me most is that we seemingly have come full circle, something that almost always happens in our business. This summer will tell us more as it unfolds. Will more and more golf courses be searching for solutions to a "new problem"?

Some researchers at Purdue University are studying the effects earthworm populations have on soil properties. I assume that means they are quantifying or measuring those effects. That they have an effect has been known for years. The Purdue study involves estimating the size of earthworm populations found under natural conditions as well as under several agricultural management systems. They found that the population ranged from 10 worms per square meter (in continuous, conventionally tilled soil) to 1,300 worms per square meter in a dairy pasture where large amounts of manure had been applied. They have observed that earthworms increased water infiltration rates about 10 times on a silt loam soil in greenhouse tests. Seedlings emerged faster and crusting was less severe on test soils where worms were active.

It is interesting that current research is including earthworms. I'd have guessed much of that kind of work had been done already. After all, the earthworm is the largest invertebrate animal living in the soil, a million times bigger than the smallest one visible to the human eye, the mite; and the mite is a million times larger than the smallest soil animal, the protozoa, which itself is a giant alongside a soil virus. There is, in fact, a considerable amount of literature about the earthworm, and not all of it from the angler or fisherman's point of view — that is what most people think of when they infrequently think of earthworms. I read in detail Izaak Walton's description of how to bait a hook with a worm in his famous book, "The Compleat Angler." I was surprised to learn that Charles Darwin's "The Formation of Vegetable Mold Through The Action of Earthworms" was a shattering revelation of scientific truth that was written and published **before** his best known work — "Origin of Species."

Man was, of course, not the earth's original farmer. Earthworms were, by virtue of their constant tilling of the soil around root areas. Because of their tireless burrowing, they are, it seems to me, the ultimate agriculturalists and an ally to farmers and Golf Course Superintendents alike. The burrows form channels, through which root growth may reach down, into the subsoil, for nutrients and moisture. These channels also absorb rainfall quickly, allowing it to move into the soil instead of running off. Corn field or golf course fairway — both are benefactors of this kind of earthworm activity.

One researcher, who has to have preceded the current Purdue investigators by quite a number of years, claimed that each day an active earthworm can absorb a quantity of soil equal to its own body weight. And it was Darwin himself who suggested that a weight of more than 10 tons of dry soil passed through earthworms in an acre of soil and was brought to the surface in a year. Later investigators upped that estimate to 25 tons per acre.

In the powerful and muscular gizzard of worms, ingested soil is ground, mixed and conditioned, and digestive secretions exert their solvent and neutralizing action. Slowly, this "paste" moves through the intestine and finally is ejected in and sometimes on the surface, forming the castings that are starting to bother Tom Harrison and Carl Grassl.

I can see the subject of earthworms coming to the front more and more often. It is a creature that we may love and hate at the same time — giving untold benefits to our golf courses and causing untold grief to our players. Maybe we'll feel somewhat like Shakespeare. Hamlet asked his friend somewhere in the Elsinore garden, "Did you know, Horatio, that without earthworms men could not create civilizations?" Horatio replied, "Until now I thought that earthworms were destined to destroy the last traces of human civilization, devouring men's corpses and swallowing up their buildings."

If the problem gets any worse, maybe we should do like Roger Bell did 30 years ago — pick up a few of those earthworms and go fishing!