The Plant Doctor's LANDSCAPE TIPS

By Dr. David L. Roberts, *The Plant Doctor LLC a.k.a. The Tree Doctor*

A COVID-19 UPDATE IN 2020

INTRODUCTION

The Coronavirus (=Covid-19) has discombobulated the human inhabitants of Planet Earth in many ways, ranging from sickness and death of millions of people and loss of family members and friends to economic hardships for many countries and their citizens. In the U.S., there are still millions of unemployed people even if the economy has improved slightly since the economic shutdown.

In the April 2020 issue of *the Landsculptor*, I published an article entitled, "Understanding Covid-19 and Other Virions" (Pages 9-14) to share awareness of the nature of viruses and pandemics. Because we have learned quite a few new things about the Coronavirus in the past several months as it wreaked havoc with our country and our industry, I thought it might be useful to discuss some factors that may help clarify some of the ongoing confusion surrounding this Pandemic. I am offering this information as a scientist, and as such, I will do my best to stay away from "politics", even though the Coronavirus has become seriously political when it should not be.

"BIOLOGY" OF THE CORONAVIRUS

Technically, according to many scientific experts, a virus is non-living (Photo 1). A virus is composed of a protein coat and a nucleic acid. That is it! No organs, no brain no heart. Nevertheless, in general, viruses would be considered "biological entities" because they are composed of protein and nucleic acids (DNA or RNA) as are all other "living" biological organisms on Earth. A virus is an obligate parasite – it cannot survive and reproduce by itself. A virus uses its living host (animal or plant or fungus or bacterium, etc.) to propagate itself. Simply put, the only reason for a virus's existence appears to be to reproduce itself – that's what it's programmed to do. Sometimes the virus kills its host and other times the virus may live in a state of "harmony" or as a parasite with its often debilitated, unhealthy host. Without a living host, the virus "dies", er uh . . . or more appropriately it becomes ineffective, inoperative and likely disappears. Many, if not most, viruses tend to be somewhat specific for their host. At this time, Covid-19 is not known to infect trees (Photo 2) and other plants, or most other animals, including birds and amphibians. So, if we take away a virus's host or the host prevents infections of the virus by some manner, such as wearing a mask, social distancing, use of sanitizing agents, etc., the virus may essentially die out and largely disappear. In the animal kingdom, such as with humans, the immune system may help the host eventually resist the infection by the virus . . . if the host can develop antibodies before it is killed. For a more extensive discussion on the "Biology" of Covid-19, please review the article cited above.

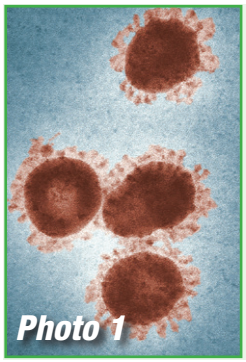

Photo 1: An electron micrograph of the Coronavirus. A virus is very small, measuring around 100 nanometers or about 1/254,000th of an inch. (Photo Credit: The U.S. Center for Disease Control.)

Photo 2: Viruses tend to be fairly specific for their host, whether the host is a human, another type of animal, an insect, a plant, a fungus or a bacterium. In other words, viruses may attack almost any living organism. Luckily for our industry, the Coronavirus does not attack trees or other landscape plants. However, this large American elm in the Grosse Pointe cities is likely to die from another invader: Dutch Elm Disease. (Author is standing next to the tree to disclose the tree's size.)

Scientific Terminology: There are a couple of terms we occasionally hear on the news that might be confusing to some individuals and which I didn't cover in my previous article on the Cornonavirus. Understanding these terms may be useful for discussion in this articles.

Titre and CFU: Titre, also known as and pronounced as "Titer", is defined as the concentration of a substance (virus) in a sample as determined by titration. Titre is simply a measure of the population of viruses. CFU, known as Colony Forming Units per a given volume, is also a measure of populations determined by titration. CFU is typically assigned to define populations of bacteria. As opposed to viruses, which need a living host to reproduce, bacteria can be propagated in aqueous solutions containing nutrients for their growth. As such, "inoculating" a container of nutrient solution with a few bacterial cells enables a bacterium to reproduce or double in population in a short time . . . in some species every 20 minutes. After 24-48 hours of incubation in the nutrient solution, bacteria may reach a population of ten to the 9th power or ten to the 12th power, representing approximately one billion or one trillion bacterial cells per ml (=milliliter or ~ one-half teaspoon of liquid), respectively. Viruses and Bacteria have caused Pandemic diseases in human populations over the millennia, killing millions and millions of people. The reason I raise these "population" issues is that many people may not understand that a single viral particle or bacterium cell cannot infect you or its host. Probably even a dozen or 1000's of viral or bacterial propagules are not likely to infect you. It usually takes millions, billions or even trillions of bacterial cells or virus particles to infect a microbe's host person or host plant in the case of plant diseases. For example, in the early 1980's, upon my discovery of the first bacterial wilt disease of turfgrasses in North America, I had to grow the bacterium to billions or trillions of bacterial cells per ml in order to infect turfgrass plants to study the disease

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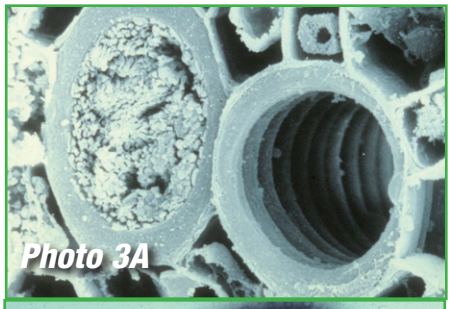
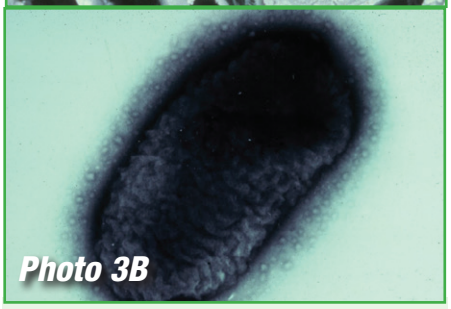
progression (Photos 3A & 3B). The same is true for example with the common disease, Fire Blight (Photo 4).

Mutation: All organisms on planet earth change over time. The change may occur by various means but "mutation" is a very common mode of change. Mutation can be defined as a sudden departure from its parent type, often by a change in an organism's DNA, which then causes a change in the organism's genes and chromosomes. These mutations result in a slightly different or markedly different virus (or microbe or organism). Mutation is often used in discussions with the Coronavirus on the nightly news. What does this mean? One example is that while most of us understand that the Coronavirus originated from China, some scientists have done studies to show that the strain of Coronavirus infecting Americans actually came from Europe. In other words, the Coronavirus probably originated in China but by the time it arrived in the U.S. via Europe, it had already "mutated" (changed) from its original form from China. It is important to understand mutation because as a virus changes it may become more virulent (deadly) or less so . . . or, the vaccines we develop today may not be as effective in a few months if the virus mutates.





Photos 3A & 3B: Photo 3A is a scanning electron micrograph of a bacterial infection of the xylem of a turfgrass plant. The rod-shaped bacteria number in the "quadzillions" in population within the plant. Photo 3B shows a single bacterial cell that measures approximately 1 X 2 microns (one micron equals about 1/25,000th of an inch).

Photo 4: Another bacterial disease is Fire Blight, such found in this photo on ornamental pear. The dark blighted shoots would microscopically exhibit bacteria populations similar to that in Photo 3.

THE CORONAVIRUS AND AMERICANS

Covid-19 has impacted almost every American in some manner whether it is the loss of a family member, friend, or colleague or whether we have had a difficult time paying our bills due to lost employment or temporary layoffs. Not to mention our more sheltered life and isolation. Much of the Covid-19 impacts have been negative for most of us but with detrimental aspects for many there are positive impacts for others. Some companies are in a boom cycle with production of items such as sanitizers, masks (Photo 5), other PPE and items necessary to combat the deadly virus.

Now for the hard part: We as Americans have not handled the Coronavirus well. It is just a fact! We have 4% of the World's population and 20% of the World's deaths (and 20% of the World's infected population). Initially, when Covid-19 deaths were approaching 15,000 in the U.S., some social media users claimed, "So what, we lose 25-30,000 people every year to influenza (Flu)". Then, when the Covid-19 deaths were approaching 25,000 in only a couple months, the same social media users claimed, "So what, we lose 40,000 Americans to auto accidents every year". Then, as the Covid-19 deaths surpassed 40,000, they again said, "So what, we lost 58,000 Americans in The Vietnam War" (note: the Vietnam War was over at least a 10-year period, not 3-4 months as with Covid-19). What these well-meaning folks failed to understand is that auto accidents and war casualties are not infectious – they cannot be transferred to other healthy people as a Pandemic virus can. This kind of constant chatter and clutter on social media is undoubtedly partly responsible for confusion among people and our collective inability to properly address this Pandemic.

Photo 5: Luckily, many people are wearing masks, which, unluckily, have now become part of our environment's litter. We can find used masks and plastic/nitrile gloves in many business parking lots.

We have more deaths and cases of Coronavirus than any other country, even those that have a much higher population than we do (examples-China and India). It is likely that some will scoff at these statistics. Some people will say that other countries are underreporting their deaths. Or, that many of the older people that died in the U.S., would have died anyway from various underlying issues. Some Americans would have died from various pre-existing conditions or underlying issues, but deaths from Covid-19 are not reported unless there was a positive test for the virus. It is highly likely that the stats underrepresent Covid-19 cases because many people died outside the hospital and were never tested. As I write this article, we are blowing through 210,000 deaths from Covid-19 in the United States. Close to 7 ½ million of us have become infected.

At the opposite end of the spectrum, Japan has about 1/3 the population of the U.S., or about 110 million people. Japan has only reported about 1500 deaths from Covid-19 to this date; furthermore, Japan most likely did not have to shut down their economy the way the U.S. did. What is the difference? The Japanese people tend to trust their scientists and medical experts more than Americans do. They quickly adopted the recommended techniques to minimize the Coronavirus ***early*** in the Pandemic, before the Pandemic got out of hand.

Following are just several examples of America's experiences with the Coronavirus I thought might be interesting to share:

Covid-19 Impacts on People: The Coronavirus affects people differently. The viral infection is often described as a respiratory problem primarily affecting the lungs, but autopsies have revealed organs such as kidneys and liver may also be destroyed. It has often been described as an older person's disease. This is not necessarily true. People

of all ages have been infected and have died. Recently, the news announced that the youngest Covid-19 casualty, a two-month old Michigander baby, had succumbed to Covid-19. On a more personal level, an acquaintance of mine in his early 50's contracted Covid-19. His primary symptom was fatigue, and he returned to work after 10 days. In another instance, a friend of a friend of a friend, who was 46 and worked at Lowes, contracted Covid-19 and died, leaving behind a wife and two children. He purportedly had no underlying conditions. People of all ages are dying from Covid-19. Obviously, the good news is that many more have survived Covid-19 than died. However, some of those individuals who have survived Covid-19 also report long term health issues.

Jupiter, Florida: I have friends who I visit in Jupiter, Florida every year, the reason this story from that area captured my attention. A fellow had been continually Facebooking that Covid-19 was a hoax. Suddenly he began Facebooking something to the effect – "Folks, my wife and I have come down with Covid. This is NOT A HOAX, and you need to take it seriously!" At one point, the husband was on the road to recovery, but his wife was still in the ICU. She eventually died. One of his last postings I read was that he supposed God and his wife would forgive him for not taking the virus more seriously. We all have our own ways of making excuses for our misdeeds.

Col. Steven L. dePyssler, Dead at 101 Years: Believed to be the only American to have served in four wars (World War II, Korean War, French Indochina War, The Bay of Pigs Invasion and The Vietnam War), Col. dePyssler devoted his life to the military in service to our country (Photo 6). After serving 38 years, this great American retired and devoted the balance of his life to helping other veterans. What made me include Col. dePyssler in this article is that we have heard politicians and other Americans claim that Covid-19 is an old person's disease. Some people have even had the audacity to suggest that these older people may be expendable in order to save the U.S. economy for younger generations.

Photo 6: Col. Steven dePyssler died after contracting the Coronavirus at the age of 101. Because he was still active helping veterans at this ripe old age, he might have continued his service if we had better management of this Pandemic.

No person should be expendable just because we are not taking the proper precautions to combat a deadly Pandemic virus. Who knows how long Col. dePyssler might have lived and continued to help other Americans if he had not contracted Covid-19.

Herman Cain: A darling of the Republican Party and former Presidential Candidate, Mr. Cain attended a rally in Tulsa, Oklahoma, where social distancing and mask-wearing was not prevalent. He died within 2-3 weeks of the rally from a Covid-19 infection he likely contracted during the rally. Cain became wealthy from a pizza empire and could afford the best healthcare and medicine the U.S. could provide. Again, how many people must die before we collectively take Covid-19 seriously?

A Michigander: Not long ago on National news, a Michigander was interviewed about Covid-19 and why he wasn't wearing a mask to a rally. He replied something to the effect, "I'm not wearing a mask; it's a violation of my freedom. If I catch Covid, I catch Covid. If I die, I die." While I am not against all of us enjoying our individual freedoms, I think it is highly irresponsible to not consider others' freedoms and their pursuit of life and happiness as well. If this Michigander doesn't mind dying, that's fine by me. But how many other Michiganders will he take to the grave with him in his negligence?

Despite the seemingly constant doom and gloom, it is always good to think positive and maintain a good sense of humor (Photo 7).

THE MASK CONTROVERSY

During the Covid-19 Pandemic, as is fitting with American ingenuity, whole new industries have developed. All kinds of new and great sanitizers have been produced. Some of the many local breweries and distilleries are now making sanitizers. What is most interesting is the vast array of masks that have been designed and produced, even foo foo ones (Photos 8A & 8B).

Like social distancing and restrictions on businesses to protect people, masking-up has become one of the most controversial issues of the whole Covid-19 Pandemic. Some have even claimed that being forced to Mask-Up is a violation of our Constitutional Freedoms (Figure 1). Government, whether at the National or Local levels in the U.S., has certain responsibilities. One of the responsibilities of Government is to protect Americans from harm whether that harm originates from outside or from within the country. The laws or policies that Government impose on us are, I think, aimed at the public good. Hence, we have speed limits in school zones of 20 mph. Is it a violation of my Constitutional Freedom that I can't do 70 mph in a school zone? The U.S.D.A. has standards for meat that are imposed on producers (farmers), meat processing plants and grocers . . . all for public health and the public well-being. There are numerous other examples. Because we have not had a truly serious Pandemic since the 1918 (Spanish Flu)

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Photo 7: Doug, a friend and colleague in the industry, contacted me this past summer about some tree issues. He also sent this selfie to remind me to wear my mask. In this Pandemic where depressing thoughts seem to rule, this photo made me laugh out loud (LOL) and made my day. We need to keep a positive attitude and remember the good times . . . and hope the Pandemic's end is near.

Photos 8A & 8B: A brand new industry has evolved as a result of Covid-19. Masks now come in all kinds of shapes, sizes, colors and designs. I would never have imagined so many people making home-made masks! This mask represents the AMC (American Motors Corporation) logo, which I can wear to car shows when I show my Gremlin (8B). I ordered my new 1972 Gremlin from the factory. In Photo 8B at a Memorial Day parade several years ago, my Gremlin leads my high school buddy's highly-sought-after, gull-winged Delorean. Don't tell my buddy but I swear my Gremlin got more stares and approving nods than his Delorean.

Alice Scuzzy's Diner

Notice to Our Valued Customers

We no longer require our waitstaff and cooks to wash their hands after using the bathroom. We do not want to violate our employees Constitutional Freedoms, which we all in this great country of ours have some to value and love. Thanks for your understanding and have a wonderful day!

The Management

Fig.1

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Pandemic, we are (unfortunately) kinda feeling our way through this one. There are many learned procedures we have adopted over the last 100 years that can be applied to Covid-19. Doctors and nurses have been wearing masks for decades when you or I are in the operating room. Why? They know that masks and sterile technique will lessen the risks of secondary infections that may be more life-threatening than the operation itself. In our industry, when we apply pesticides, depending on the toxicity of the pesticide, we may be required to wear certain types of PPE (Personal Protective Equipment) that is designed to protect us.

It is an interesting statistic that far more women wear masks than men. Why? Are we men too macho? Do we not want to mess up our hair? Even Big Boy will mask-up (Photo 9).

Facts vs. Facts: There are facts and then there are facts. It is easy to become embroiled in controversy when social media is inundated with "facts" and "pseudo facts". Because of social media, I think it is a natural tendency to search for the facts that support our desires and go with them. For example, if I don't want to wear a mask, I'll latch onto someone's claim that masks do not protect humans against Coronavirus infections and go with it . . . because I saw it from an "expert" on social media. There are plenty of experts who declare that masks do not protect us. They may cite the fact that the Coronavirus is only about 125 nanometers (about 1/254,000th of an inch) and that it will go right through an N-95 Mask; that statement is factual and true. So, I might decide to not wear a mask based upon that fact. However, another fact that is equally true and supersedes the previous one about the virus particle size factoid is as follows: **One Covid-19 virus particle is not capable of infecting a person.** It actually takes a substantial "titre" of virus particles, probably measured in the billions or trillions to infect a person. In slang terms, I call this a "Slug of Virus Particles". Virus particles are typically carried passively – they cannot fly or motivate on their own. In the case of Covid-19, it is believed that the virus is carried on small vapors or water droplets from someone's breath, originating from their lungs (Photo 10). Recent evidence from scientists also tends to suggest that these tiny water droplets can remain suspended in the air for quite some time. It is these tiny vapor droplets (**MUCH** larger than a single viral particle) containing billions or trillions of virus particles from an infected person's breath that we hope to stop with a mask.

Photo 9: Many Americans refuse to wear masks. Is it because we are so concerned about our appearance? Are men especially worried that masks violate their Constitutional Freedoms? Big Boy doesn't think so.

THIS IS NOT A DRILL

The Coronavirus, aka Covid-19, is the real deal. It is the cause of the current Pandemic in which we find ourselves and where millions of people around the world are sick, dying, and/or out of work. This devastation is what "Pandemics" do. Many scientists do not consider Covid-19 nearly as lethal or destructive as the 1918 Pandemic Virus. Nevertheless, Covid-19 is sufficiently serious to have caused numerous deaths, debilitated survivors, and the most serious economic conundrum since The Great Depression . . . primarily because we let it. As Americans, we are quick to react militarily against terrorists or another country's attack upon our citizens or soil. However, because viruses are microscopic, they are often referred to as "The Hidden Enemy" or "The Silent Killer". Pandemics can be and are often far more deadly than terrorist attacks and war. In my opinion, we as Americans have not taken the Covid-19 Pandemic nearly serious enough. We are still in the first phase of the Pandemic because we never took sufficient measures as other countries have. As of this writing, we are losing between 750 and 1000 American lives ***every day***. And there are between 30,000 and 50,000 new infections ***every day***.

Photo 10: Is this an arborist taking a smoking break among the trees? Actually, I coerced another arborist and industry friend (John) into helping me experimentally demonstrate the spread of lung vapors (potentially containing Covid-19 virus particles if he is infected) that we might commonly see as our breath on a cold morning in Michigan. Because the temperature was warm, I suggested he use cigar smoke. Note how the dissemination of cigar smoke along with vapor from his lungs spread quite a distance to his right. John asked me to inform readers of this article that, like Bill Clinton, he doesn't inhale.

THIS IS A DRILL

Due to the explosion of the human population on Plant Earth over the last several millennia, the widespread and frequent travel of humans across the planet, and the destruction of natural habitat (where many exotic "bugs" occur), the chance of further pandemics is constantly increasing. One can well imagine or even engineer in our minds another Pandemic Virus or Bacterium, which has some characteristics of Covid-19 (highly infectious, delayed symptomatology, etc.) but which is far more lethal to humans. For example, Ebola exhibited a death rate ranging from 20-90% with an average death rate of 50%. Imagine 50% of the people around us dying from an aggressive Pandemic agent. Ebola was quickly addressed by the U.S. and minimized. What concerns me most is that if we use our reaction to Covid-19 as our policy template for future Pandemics, we may be in serious trouble as Americans and as humans on this planet.

PRACTICAL MANAGEMENT OF THE CORONAVIRUS- IT'S ALL ABOUT RISK

It almost seems with our reaction to the Covid-19 Pandemic that we as Americans are too self-centered to be bothered by a major disruption in our lives. We want to go about our daily lives without any interruption. Whether God or Mother Nature has other plans, we need to adjust, adapt and do the best we can. What happened during World War I and World War II? Most Americans pulled together to defeat the enemy. Currently, our enemy is Covid-19. We are not helpless; we can do much better.

The Great Experiment: Whether we want to acknowledge it or not, we as Americans are in a great experiment. We've already gathered a "treeeemendous" amount of data. This data can be collected from all over the U.S., if we keep our eyes and ears open. Whenever we practice the scientists' and medical practitioners' recommendations, virus infections and deaths decline. Whenever we "open up" and disregard the recommendations while opening up, the number of Covid-19 cases and deaths spike.

Photo 11: This wedding reception just down the road from my residence last June shows insufficient social distancing even if masks are worn.

So, here again are the techniques that can serve us well. Note: I'm not suggesting we not go to work or not interact with others; I'm just suggesting we be smart about it and not assume the Pandemic is over. If we assume the Pandemic is over, it will likely explode as it is expected to do during the cooler/cold fall and winter.

1. **Sanitary Procedures:** Wash your hands and/or sanitize them often, especially during visits to public places. And don't touch your face until after you've cleaned up. Sensitive tissues around your nose, eyes and mouth are readily infected by Covid-19.
2. **Social Distance:** When practical, it is wise to social distance. If we never left home, the risk of infection is far less than our frequent interactions in public places. While it may not be practical for many of us to stay at home full time, combining other procedures with public interactions can help reduce the risks of infection. Too many Americans are not respecting Social Distancing (Photo 11).
3. **Mask-up:** Just as Doctors and Nurses do on a routine basis, even before the advent of Covid-19, we need to cover our mouth and nose, not only to protect ourselves but others. Half Mast Masks are not as effective as full covering (Photo 12).

Photo 12: Many people are not wearing their masks properly for protection against Covid-19 or to minimize its spread to others. Some men even wear their mask low as a beard covering. Half Mast Masks are not as effective as full nose and mouth covering.

4. **Stay Healthy:** We need to maintain good health with sufficient sleep, good eating habits and exercise. Too much alcohol can weaken our immune system and make us more susceptible to Covid-19 and other diseases (common cold, flu, etc.).
5. **Self-Isolate & Test:** If we are feeling bad and are not sure if we have contracted the Coronavirus, it might be best to self-quarantine until we can be tested.
6. **Get a Flu Shot:** To avoid the common Flu this winter season, we may want to consider getting a Flu shot. Hopefully, this vaccination will prevent us from getting the Flu, which could be mistaken for Covid-19. We don't yet know if having the Flu will make us more susceptible to Covid-19.
7. **Respect Others:** It is always wise to protect other people whether they be family, friends, acquaintances, our clients or other humans on this planet.

A few days before submitting this article to the MGIA Editor, the President and First Lady of the United States tested positive for the Coronavirus. Subsequently, several other individuals in their circle tested positive as well. We hope for their speedy recovery. Hopefully, these latest developments will urge all Americans to take the Covid-19 Pandemic seriously. Please stay smart, healthy, and safe!

Dr. David Roberts has retired from Michigan State University but intends to remain active with the industry. He is CEO and CBW (Chief Bottle Washer) for The Plant Doctor, LLC. Contact information: 248/320-7124 and treedoctordave@gmail.com.