



More ▾

TURF HACKER

Ideas about growing grass

[Home](#)

[Jason's Productivity Files](#)

[Support me on Patreon](#)

SUNDAY, 25 MARCH 2018

BUY

VISA

FEAT

**Turf
Tha**

Ever
gues
prior
on th



POP



prett
why



Does Aerification Make Disease Worse?



Have you ever noticed a disease outbreak immediately following aerification?

I'm pretty sure most people have and this is why it is common practice to spray a fungicide before aerifying. Why does this happen?

I always blamed the disease outbreak on the mechanical stress we put the grass under. I also noticed

that the abrasive practices used to drag the sand into the aeration holes would spread the disease like crazy.



Fusarium Spread from verticutting after aeration

Niels Dokkuma from the Koninklijke Nederlandse Golf Federatie visited my course in February of 2017 to see what I was doing to reduce the pesticide use on my golf course because the Netherlands are facing an almost complete ban on pesticides in 2020 so they need to learn whatever they can to avoid disaster.

He asked me a seemingly simple question. "Do you think aeration makes disease worse?"

Of course I agreed with him and went into discussion about how we spread the disease around and the mechanical stress that goes on etc. We pretty much left it at that but ever since that meeting I have been thinking a lot about this.

Does aeration cause disease?

Does the physical act of increasing macropores in the soil make disease worse?

I know you're thinking this guy is nuts! Aeration is nothing but good, right? Aeration makes disease less bad, right?

Lets forget the pain in the ass that aeration is. Broken equipment, bumpy greens, huge expense loss of revenue, and poa seed brought to the surface. Lets forget about the obvious downside of aeration and think a bit about how else it could be hurting our operation.

Check out the following video where Dr. Thom Nikolai discusses the "most significant discovery of his research career." If this is the most important discovery of his research career I wonder what the most important discovery of his not-research career is?

The research that he and his associates did on rolling and dollar spot is some of the most interesting

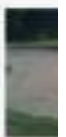
is pe



ferti



shee



main
Supe



was
get ..



meet
the h



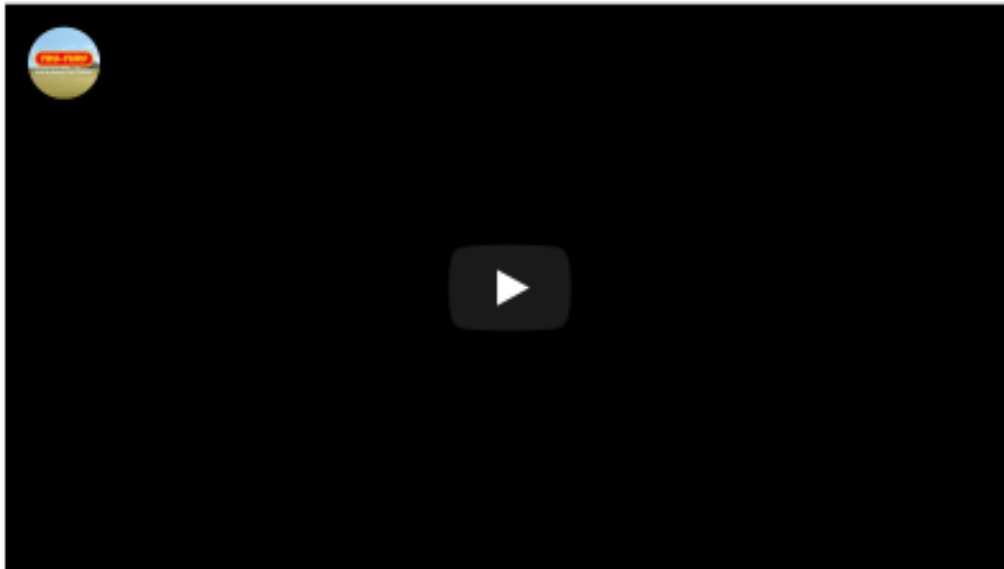
2018



Last
I cou
into r
weat

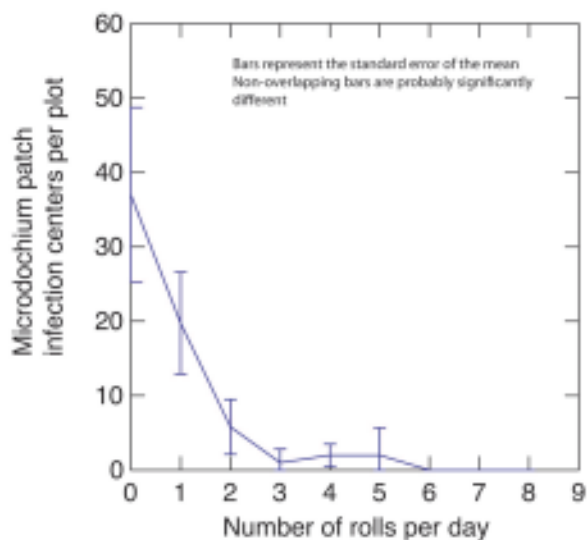


research in the world of turfgrass management in my opinion. In the following video clip he discusses why he thinks rolling reduces dollar spot.



Cool, so rolling reduces dollar spot. What about other diseases?

A few years ago I discovered that rolling reduces fusarium patch!



So wait, if rolling reduces major diseases like dollar spot and fusarium patch wouldn't that suggest that compaction (or compression of the top mat layer) reduces disease and not aerification? Isn't rolling the exact opposite of aerification?

We all see the disease following aerification, see the results that compacting or compressing the soil can have on disease then say that aerification reduces disease!

Sounds a bit backwards to me! Sounds like a lame justification to do a practice that none of us like doing too. It's required to manage organic matter, infiltration rates and disease.

Bullshit!

have

BLO

▼ 2



► 2

► 2

► 2

► 2

► 2

► 2

► 2

► 2

LABI

#clip

aeral

anthr

apps

Bent

biolo

Budg

clippi

clove

comr

Cyar

Dew

digit

Dise:

Maybe if the soils have been allowed to get to a point of neglect aerification will help but I think that with the tools and knowledge that a typical superintendent has available, we should be able to forget about the blanket aerification practices that are so common in our industry.

We've all heard of the general recommendations for aerification. Anywhere from 10%-20% surface disruption to ensure we don't run into trouble. This is probably a great general recommendation but it doesn't take your specific situation into account and this is one of the reasons I hate generalized agronomic recommendations. Every course is different. Different climate, different grass, different construction, different amount of traffic, and different budget.

If we are measuring clippings and only applying fertilizer to make the grass grow faster when required we should be able to make better use of the nutrients release from the soil organic matter and therefore use up that organic matter instead of continuously add to it. Add to this topdressing as required to keep the organic matter in check as determined by regular soil testing we should be able to eliminate the need for core aerification to remove excess organic matter. If we can be more precise with our fertilizer applications and growth rates we should have less waste and therefore less need for corrective maintenance practices.

What about infiltration? Surely aerification helps with infiltration! Yes, we've all seen the videos of an aerifier running over a puddle on a putting green and watched the water disappear almost instantly. I've always done this and even left the holes open during the winter to help aid in the drainage only to find that a few weeks following aerification the greens would puddle and we would be back to square one.

This winter I decided to try something new. I tried aerifying less aggressively and decided to use a penetrant ([wetting agents, what's the difference?](#)) through the winter. I don't have any quantitative data on this yet but what I can say with almost certainty is that our 30 year old greens have never drained better!

Our 4th green is severely sloped towards a sand trap and for the 17 years I have been here the sand trap would wash out every time it rained. This February we had a rain event that dropped over 100mm of rain in less than 24 hours.

disec
Dolla
drou
effici
EIQ
envri
equip
expe
fairw
fertil
Form
funny
Fusa
Goog
Gree
Grow
grow
grub:
hack
Heig
hud (
IPM
iron (
irriga
job b
labor
learn
M. ni
math
Micr
minir
MLS
mos
Mulc
newt
nitro
opini
Orga
other
Pesti
Pesti
pH (
phos
pigm
Poa



The typical situation on our 4th green. This as the only time this winter we had a washout due to frozen soils.

So I went out to repair the trap in the morning to find that it wasn't washed out literally for the first time in 17 years! The bottom of the trap was full of water because it just rained 100mm and we don't aerify or spray wetting agents in the traps (maybe we should?).

This observation suggested to me that the rain went down into the soil instead of running across the surface and into this sand trap. All winter this has happened except for during the snow melt where the putting green soil was frozen solid and therefore not able to drain properly. Knowing if drainage is good is now very easy. If that trap washes out, I need to improve drainage. If it doesn't wash out, drainage is within tolerable levels and better than any time before 2018 in the club's history! No fancy tools needed although I am going to look into getting a way to quantify infiltration rates better.

prim
putt
putt
R. ce
robot
rollin
salar
sand
sand
Seec
Shac
silica
silver
Sma
socia
soil r
STIN
Suns
supe
Susti
techn
Turf
UAV
urea
VMC
Wate
weec
wetti
white
winte
wood
yellow

FOLI

Erma



Jason Haines
@PenderSuper



Surface drainage from the green goes right into trap, but there was no washout, water is going down through soil. Trap is rarely this wet, maybe 1-2x per year.

♡ 2 3:07 PM - Jan 21, 2018

[See Jason Haines's other Tweets](#)



So has aerification helped my greens drain better in the past? Not from what I've seen. Maybe it will get worse with no aerification so I will watch this in the future to make sure that they continue to drain as expected.

I think a lot of our issues with water infiltration come down to hydrophobic soils and I wonder if aerification makes this worse as well. When we aerify the greens we create these awesome holes for the water to flow down. Water is lazy so it always takes the path of least resistance and this can be called preferential flow in soils. If all the water is flowing down these few channels what is happening to the water and the soil surrounding these holes?

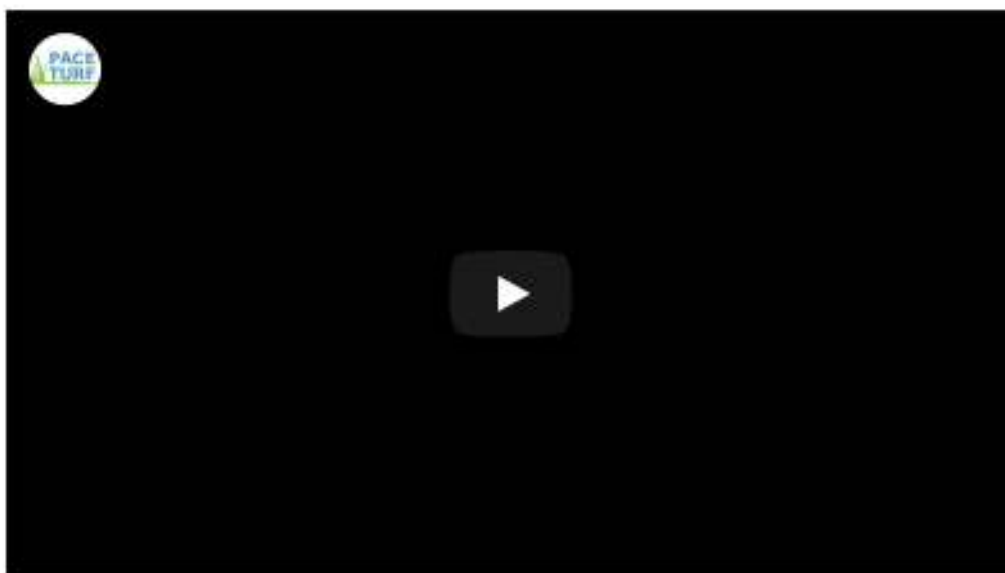
We have all seen the nice green holes following aerification and I wonder if it is that the grass in the holes is healthier or if the grass beside the holes is suffering because it is getting none of the water and gas exchange because of preferential flow. If we only disrupt 10-20% of the surface does the other 80-90% suffer?



Testing soil bulk density. Is the grass greener in the aeration holes or is the grass less green because of the aeration holes?

It's a really easy thing to try. Spray a penetrant on your greens in the winter and see if drainage improves. I think you will see that you get better drainage than ever before which makes me wonder why we would need to aerify to improve drainage if it only improves things for a short time and not even in a significant way?

The video below by Pace Turf shows how this phenomenon can impact soils that are high in salts.



When it comes to hydrophobic soils I wonder if aerification makes it worse by drying out the soils surrounding the holes. In the winter time we don't notice the hydrophobic areas because et rates are low and precipitation is high but as soon as it warms up we see the same localized dry spots in the same location year after year.

What if we don't create preferential flow opportunities and just use penetrants to uniformly wet the soil all winter long. Will that help our localized dry spot issues in the summer? I've heard some talk of this in Scotland and I think there might be something to this idea. Bottom line, my greens have never been drier in the winter or drained better.

So what about aerification makes disease worse? In Nikolai's rolling research they found elevated levels of beneficial bacteria in the soil as a result of the rolling. It wasn't dew removal, it was the soil biology that they think were making the difference. It also appears that a more compressed soil favors bacteria which could compete with the fungi that cause all our problems.

So I think we need to focus on when it comes to soil aerification is to determine what is the optimum compression or compaction and work to keep our soils within tolerable limits.



The look of the profile continues to improve despite less aerification than ever before.

Maybe this is why most people see so little success with compost teas and bio-amendments. If you add these beneficial organisms to an environment that isn't ideal for them, they simply die. **Hey Rob Wilke, do your soils ever dry down up there?** Maybe the success Rob sees with compost and wood has a lot to do with almost constantly saturated soils in one of the rainiest places on earth. Wet, slightly compacted soil is ideal for bacteria that compete with the fungal pathogens..... Maybe too much air is a bad thing?

I'm over aerification. Instead, I have started measuring the physical properties of my putting greens and will monitor them over time to see if they change or fall outside of tolerable limits. I will try and avoid issues with compaction, excessive organic matter buildup and drainage without poking holes but will still keep aerification as a tool in case some areas run into trouble. I am currently measuring soil bulk density, infiltration rates and organic matter content. By tracking this over time **on my HUD** I should be able to make better decisions about when and how I aerify my greens, if at all.



Maybe we can find out what the ideal soil properties are for healthy soils and stop the ideas of more is better when it comes to aerification because the way I see it, more is definitely not better. I think a lot of our reliance on aerification comes from not measuring our soil properties and simply guessing too much. Maybe we can aerify less, and improve conditions?

Or maybe I'm completely insane.....stay tuned to find out!

If you like my blog and want to support what I do you can support me on [Patreon](#) or [paypal](#). Thanks!

Posted by [Jason Haines](#)



Labels: [aeration](#), [rolling](#), [soil moisture](#), [Turf disease](#), [wetting agents](#)

2 comments:

Kees van der Vliet 2 November 2018 at 08:18

Hello Jason, I was reading in on your posts as I will be attending your talk for Dutch greenkeepers on November 28.

While reading this post about aeration vs penetrants a question popped up in my head and I was hoping

you could shed some light on it.

My question is; do you worry about disrupting the ecological balance in your soils by using the penetrants? I try, as all dutch greenkeepers do, to stimulate more "ecofriendly" ways of greenkeeping in my workmethods.

All this because the dutch are facing a very likely total ban of chemicals on our courses in 2020.

I am a big fan of Jim Arthurs book 'practical greenkeeping' and i try to follow his non disturbance theory where i can.

Problem i have with today's penetrants is that they might erase some of the good we do and promote in the soil.

Maybe you could comment on this subject during your visit to Holland?

Kind regards, Kees van der Vliet headgreenkeeper at golfbaan Waterland Amsterdam

[Reply](#)

▼ [Replies](#)



Jason Haines 2 November 2018 at 11:33

Hi Kees,

I think you could be right but so far it's really hard to tell. I recently tried using a penetrant again this past week to improve drainage with no difference between the check plots that i left out. Having said that, I think the best way to achieve drainage is through mechanical aerification but again, only do it if needed and beware of the potential consequences.

I look forward to meeting you in person in a few weeks!

Jason

[Reply](#)

Enter your comment...



Comment as: **Force Of Nature** --

[Sign out](#)

[Publish](#)

[Preview](#)

☐ [Notify me](#)

[Newer Post](#)

[Home](#)

[Older Post](#)

Subscribe to: [Post Comments \(Atom\)](#)



Google Sheets

Sorry, unable to open the file at this time.

Please check the address and try again.

Get stuff done with Google Drive

Apps in Google Drive make it easy to create, store
and share online documents, spreadsheets,
presentations and more.

Learn more at drive.google.com/start/apps.

Jason Haines. Picture Window theme. Powered by Blogger.