

## Sustainability of Organic Spinach Review - Attendee List

<u>Name</u>	<u>Company</u>	<u>Email</u>
Neil Bushong	Bajo Seeds	<a href="mailto:n.bushong@bajoseeds.com">n.bushong@bajoseeds.com</a>
Alan Bornt	Bornt & Sons	<a href="mailto:alan@bornt.com">alan@bornt.com</a>
David Pratt	Bornt & Sons	<a href="mailto:dpratt@bornt.com">dpratt@bornt.com</a>
Ryan Martin	Bornt & Sons	<a href="mailto:ryanmartin@bornt.com">ryanmartin@bornt.com</a>
Eric Driedger	CPS	<a href="mailto:eric.driedger@cpsasu.com">eric.driedger@cpsasu.com</a>
Jerry Muldoon	Dole Fresh Vegetables	<a href="mailto:jerry.muldoon@dole.com">jerry.muldoon@dole.com</a>
Jeremy Vanderzyl	Duncan Family Farms	<a href="mailto:jeremy@duncanfamilyfarms.com">jeremy@duncanfamilyfarms.com</a>
Will Feliz	Duncan Family Farms	<a href="mailto:will@duncanfamilyfarms.com">will@duncanfamilyfarms.com</a>
Ramy Colfer	Earthbound Farms	<a href="mailto:rcolfer@ebfarm.com">rcolfer@ebfarm.com</a>
Steve Ray	El Ray Seed	<a href="mailto:elrayseed@gmail.com">elrayseed@gmail.com</a>
Jason Howe	Enza Zaden	<a href="mailto:jason.howe@enzausa.com">jason.howe@enzausa.com</a>
Tim Wexler	Fresh Express	<a href="mailto:twexler@freshexpress.com">twexler@freshexpress.com</a>
Larry Ott	Gila Valley Farms	<a href="mailto:larry@gilavalleyfarms.com">larry@gilavalleyfarms.com</a>
Richard Poels	Gila Valley Farms	<a href="mailto:richie@gilavalleyfarms.com">richie@gilavalleyfarms.com</a>
Dallas Piscopo	Gowan Company	<a href="mailto:dapiscopo@gowanco.com">dapiscopo@gowanco.com</a>
Sandra Alcaraz	Gowan Company	<a href="mailto:salcaraz@gowanco.com">salcaraz@gowanco.com</a>
Chris Hoppe	Gowan Seed	<a href="mailto:choppe@gowanseed.com">choppe@gowanseed.com</a>
John Mai	Gowan Seed	<a href="mailto:jmai@gowanseed.com">jmai@gowanseed.com</a>
Mike Raine	Gowan Seed	<a href="mailto:mraine@gowanseed.com">mraine@gowanseed.com</a>
Scott Richards	Gowan Seed	<a href="mailto:srichards@gowanseed.com">srichards@gowanseed.com</a>
Charles Narramore	GVFS	<a href="mailto:cnarramore@gvfsinc.com">cnarramore@gvfsinc.com</a>
Brett Sefick	Holaday Seed	<a href="mailto:bsefick@holadayseedcompany.com">bsefick@holadayseedcompany.com</a>
Brian Atchley	Holaday Seed	<a href="mailto:batchley@holadayseedcompany.com">batchley@holadayseedcompany.com</a>
Brian Cavalli	Holaday Seed	<a href="mailto:bcavalli@holadayseedcompany.com">bcavalli@holadayseedcompany.com</a>
Brian Kirkpartirck	Holaday Seed	<a href="mailto:bkirkpatrick@holadayseedcompany.com">bkirkpatrick@holadayseedcompany.com</a>
Kollin Holzwont	Holaday Seed	<a href="mailto:kollin@holadayseedcompany.com">kollin@holadayseedcompany.com</a>
Tyler Shaddy	Holaday Seed Company	<a href="mailto:tshaddy@holadayseedcompany.com">tshaddy@holadayseedcompany.com</a>
Isidro Bargas	JV Farms	<a href="mailto:lbargas@agricolaeltoro.co,m">lbargas@agricolaeltoro.co,m</a>
Jose Macias	JV Farms	<a href="mailto:jmacias@agricolaeltoro.com">jmacias@agricolaeltoro.com</a>
Matt McGuire	JV Farms	<a href="mailto:mmcguire@jvfarms.com">mmcguire@jvfarms.com</a>
Matt Di Eri	Keithly-Williams	<a href="mailto:m.dieri@keithlywilliams.com">m.dieri@keithlywilliams.com</a>
Eric Lyerly	Keithly-Williams	<a href="mailto:elyerly@keithlywilliams.com">elyerly@keithlywilliams.com</a>
Doug Sousa	Mission Ranches	<a href="mailto:dsousa@missionranches.com">dsousa@missionranches.com</a>
Jim Clayton	Mission Ranches	<a href="mailto:jclayton@missionranches.com">jclayton@missionranches.com</a>
Karlen Walso	Mission Ranches	<a href="mailto:kwalso@missionranches.com">kwalso@missionranches.com</a>
Mike Pasquinelli	Nature Fresh Farms	<a href="mailto:mike@naturefreshfarms.com">mike@naturefreshfarms.com</a>
Doc Wilcoxson	Pop Vriend	<a href="mailto:dwilcoxson@popvriendseed.com">dwilcoxson@popvriendseed.com</a>
Chris Miller	Rijk Zwaan Seed Co	<a href="mailto:c.miller@rijkszwaan.com">c.miller@rijkszwaan.com</a>
Joe Vandiver	Rijk Zwaan USA	<a href="mailto:j.vandiver@rijkszwaan.com">j.vandiver@rijkszwaan.com</a>
Dale Palmer	Sakata Seed	<a href="mailto:dpalmer@sakata.com">dpalmer@sakata.com</a>
Manny Silva	Santa Maria Seeds, Inc	<a href="mailto:manny@santamariaseeds.com">manny@santamariaseeds.com</a>
Steve Cohuru	Santa Maria Seeds, Inc	<a href="mailto:scohuru100@aol.com">scohuru100@aol.com</a>
Jay Schafer	Schafer Ag Services	<a href="mailto:schaferag@hotmail.com">schaferag@hotmail.com</a>
Tim Butchor	Select Seed	<a href="mailto:tbutchor@selectseedcompany.com">tbutchor@selectseedcompany.com</a>
Jesus Vidal	Seminis	<a href="mailto:jesus.vidal@monsanto.com">jesus.vidal@monsanto.com</a>
John Purcell	Seminis	<a href="mailto:jpurcelle@monsanto.com">jpurcelle@monsanto.com</a>
Lyle Franklin	Seminis	<a href="mailto:lyle.franklin@monsanto.com">lyle.franklin@monsanto.com</a>
Ray Volin	Seminis	<a href="mailto:ray.b.volin@monsanto.com">ray.b.volin@monsanto.com</a>

Heather Scattini  
Chris Bourguignon  
Ken Berry  
Mike Trebino  
Jerrett Stoffel  
Juan De Anda  
Luis Carlos Buzane  
Oscar Vasquez  
Daniel Alameda  
Steve Alameda  
Richard Romero  
Tony Romero  
Eric Schwartz  
Jim Correll  
Lindsey du Toit

Sunrise Seed  
Syngenta  
Syngenta  
T&L Supplies  
Taylor Farms  
Taylor Farms  
Taylor Farms  
Taylor Farms  
Top Flavor Farms  
Top Flavor Farms  
TSL Seed Co  
TSL Seed Co  
United Veg Coop  
University of Arkansas  
Washington State University

[heather.agsates@gmail.com](mailto:heather.agsates@gmail.com)  
[christoper.bourguignon@syngenta.com](mailto:christoper.bourguignon@syngenta.com)  
[ken.berry@syngenta.com](mailto:ken.berry@syngenta.com)  
[mtrebino@howstartnursery.com](mailto:mtrebino@howstartnursery.com)  
[jstoffel@taylorfarms.com](mailto:jstoffel@taylorfarms.com)  
[jdeanda@taylorfarms.com](mailto:jdeanda@taylorfarms.com)  
[lbuzani@taylorfarms.com](mailto:lbuzani@taylorfarms.com)  
[ovasquez@taylorfarms.com](mailto:ovasquez@taylorfarms.com)  
[daniel@topflavor.com](mailto:daniel@topflavor.com)  
[steve@topflavor.com](mailto:steve@topflavor.com)  
[richard@tslseed.com](mailto:richard@tslseed.com)  
[tonyr@tslseed.com](mailto:tonyr@tslseed.com)  
[ericsschwartz.oms@comcast.net](mailto:ericsschwartz.oms@comcast.net)  
[jcorrell@uark.edu](mailto:jcorrell@uark.edu)  
[dutoit@wsu.edu](mailto:dutoit@wsu.edu)

Phone-In

Rodney Braga  
Raul Garnica  
Peter Cling  
Pat Collins  
Joe Tonascia  
James Bullock

Braga Ranch  
Braga Ranch  
Braga Ranch  
Dole Fresh Vegetables  
Tonascia Farms  
State Garden

[rbraga@bragaranch.com](mailto:rbraga@bragaranch.com)  
[rgarnica@bragaranch.com](mailto:rgarnica@bragaranch.com)  
[pcling@bragaranch.com](mailto:pcling@bragaranch.com)  
[pat.collins@dole.com](mailto:pat.collins@dole.com)  
[tonascia@sbcglobal.net](mailto:tonascia@sbcglobal.net)  
[jbullock@stategarden.com](mailto:jbullock@stategarden.com)

Objective – Make sure everyone is on the same page with:

Understanding where we are today as an industry

This is an industry wide issue and not just a seed company issue

Make sure everyone understands the current path is not sustainable

### Downy Mildew

Twenty-five years ago we were up to race 4. (Pathogen in these notes refers to plant pathogen and not a food safety pathogen).

“If industry doesn’t come together as a group, the industry will go down as individuals”.

Downy mildew is striping races quicker than breeders can keep up, with no end in sight. This pathogen is up to race 14. As such, its very hard to predict what races will predominate in a particular region.

University of Arkansas received \$1mm from the federal gov’t to find molecular markers.

It will take even more funding to understand how Salinas and Yuma are related and how the organism is evolving so rapidly. The pathogen is becoming much more complex.

DM thrives in cool, damp environments, particularly the underside of spinach leaves. Spores can easily become airborne and is thought to live dormant in soil for up to 20 years. The soil hypothesis needs to be vetted out but indications are this is accurate.

Spore elation is very aggressive. It can come on very strong in just a matter of a few days under the right conditions. This is why fungicides are not the answer. Spores can colonize in 6-8 days.

A very light wind can carry spores great distances.

Spores don’t like UV light so night time winds are the best way to spread. A single spore can produce 10’s of 1,000’s in a matter of days.

Can spread through equipment or even the bottoms of boots.

Oospores – dark, color resistance, dormant for many years in soil so even green-bridge breaks don’t work. The next time spinach comes back into a field the spores can inoculate and spread. Don’t know of any application today that is very effective.

University of AR will work with anyone who will send in samples. Be aware that samples are opportunistic and thus aren’t always statistically valid because people only send in problems. Today its becoming more common to see multiple races in one location – this is new.

Replication - only aware of growth on spinach leaves. Cannot replicate the pathogen in a petri dish yet which makes study difficult.

The pathogen can be seed born. Hot water bath showing some signs of promise but it doesn’t work all of the time.

Soil survival is still a hypothesis and needs funding to study.

Molecular tests show the pathogen DNA is in the soil but tests cant determine if it was alive or dead.

Races started climbing rapidly from 2003 to today. We have jumped ten races in just the past ten years. At the current pace we will be at a crisis point in the near future.

### Follow up question -1

How much focus is the CA Leafy Greens Advisory board putting toward the issue and can they do more through an assessment?

Total worldwide spinach seed production – 16,000 acres in Denmark, compared to 2,500 in Pacific Northwest. New Zealand and South American have some acres but nothing measurable. Denmark won’t focus on organic because of the time and cost investment compared to conventional. Europe doesn’t have the ground available to do research.

### Follow up question - 2

Is it possible to use treated seed for organic? Will the Fed's give a variance until a solution is found? (Many people felt the organic trade associations would fight this).

There is no recourse to a neighbor harvesting a fresh field at night for the freezer knowing it is infected with downey-mildew (from a regulatory standpoint). Copper is the only alternative to try and slow it down.

### Follow up question - 3

Can other associations like Western Growers or Grower-Shipper allocate funds for research?

CA Seed Association and Organic Trade Association should work with CA Leafy Greens Research Board and pool resources

Cladosporium is another pathogen to watch for. It loves 30-40 degrees. Loves wet and cold like our sprinkled fields in Yuma. Can be wind-borne. Easily treated with hot water on seed.

Downey-mildew needs more research to understand how spores are inoculated and infect a crop.

Best defense today is variety in a field (from an economic standpoint). If a grower focuses on one variety and it gets hit the field is gone.

The question came up on legislating a break in the green bridge, but if the soil dormant hypothesis is correct this won't help.

Today we are seeing race 10-11-12-13-14 in the same area. We have never seen this before.

Jim Correll will take any samples he can get but understand they can't be totally collated to the season and field because samples are opportunistic.

Fastest research method is to work in a green house setting for trials in California if anyone wants to donate space and materials.

Current Yuma season is mostly race 12-13.

If you send samples to be analyzed try to separate since mixed samples are hard to analyze.

### Conclusions

If you are interested in a working group or working more directly with Jim Correll or Lindsey du Toit please contact them directly.

Talk to your organic trade association and understand what else can be done so resources can be pooled versus starting another working group.

*The current path is not sustainable.* This is everyone's issue from processor, to seed company, to the grower. It has already started with downey-mildew pressure in Yuma today. If the industry bids up available seed it will only drive costs and not address the issue of sustainability.

DM is affecting the current Yuma season.