

Boosting Crop Yield with Cold Plasma



Transforming Seed Health and Crop Performance

We are changing the economics of crop production with a simple, dry treatment for seeds that boosts yields – often by 20% or more.

We use cold plasma to create ActivatedAir - a dry process that boosts and synchronizes germination rates. It eliminates seed-borne pathogens. It is unique and has taken decades of research to become commercially viable.



What is Cold Plasma?

Zayndu's ActivatedAir is just air – but raised to a very high energy level. We use cold plasma to provide that energy, loosening the bonds between the air's molecules. Lightning does this, creating air that is both a powerful disinfectant and a natural fertiliser. Zayndu does the same thing without the drama, heat and high energy of lightning. The seeds stay dry and cool throughout.

ActivatedAir - a natural, dry, pesticide and fertiliser.



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Delivering an Average 20% Increase in Crop Yields:

The crop yield benefits of Cold Plasma are well proven:

- Faster germination
- Stronger seedling growth
- Reduced pathogen load
- Completely dry process

The example data below is from customers and partners who are enjoying the increased production cold plasma offers:



Pathogen Control

We develop a treatment protocol for every seed variety - we've treated around 100 varieties across 40 species. Each protocol is optimised. Most growers want a balanced treatment that boosts crop yield and reduces pathogens; others want total elimination of pathogens. The protocols can be tuned to suit these varying needs.

Ask us about our progress on human pathogen reduction - a key research area as we develop protocols for zero-wash salads.

Applicability of Cold Plasma and ActivatedAir

ActivatedAir protocols have been developed for around 100 different seed varieties so far. They have proven successful with every seed trialled, boosting the performance of the crops regardless of their genetic background.

The only seeds we don't process are pelleted seeds (the ActivatedAir cannot reach the seeds) and seeds treated with chemical pesticides, other than where we have developed a specific protocol - we cannot guarantee how the chemicals in a pesticide will react to plasma.

Implementing ActivatedAir

ActivatedAir systems are best placed at the entrance to a grower's facility, acting as a biosecurity gateway. We support this by installing machines on site.

The system is controlled via an intuitive touch screen, with extensive training provided for growers.

At installation, the machine will be provisioned with a set of treatment protocols designed for that specific farm. As we work together, these protocols may be further optimised

to ensure the system delivers the best performance for that particular facility.

Commercially, there is a small up-front charge for the machine, followed by a monthly subscription which covers use of the machine, and the optimisation and support services from our biologists and agronomists. It also includes all maintenance and support.

Applying the Process

Seeds are placed in a drum, which is then mounted on the machine. As the drum slowly rotates, the machine creates cold plasma within the drum. This then generates cool ActivatedAir close to the seeds, exposing all surfaces and providing benefits uniformly throughout the batch.

At the end of the treatment, the plasma power is turned off, the ActivatedAir is converted back to room air, and the seeds are removed for storage or planting. No water is used in the process. The only thing that comes out of the drum is air - and the seeds, cleaned and vitalized.

Plasma Physics

While "Cold Plasma" and "ActivatedAir" sound complex, they are based on lightning, a naturally occurring process. We have tamed the lightning concept, using a very small amount of electricity to create a cold plasma, maintaining the seeds at room temperature.

The machines are designed to comply with both European and North American safety standards. At the end of a treatment, the ActivatedAir loses energy, collapsing back into regular air. No chemicals are used, and the process is completely dry.

Treatment Protocols and Traceability

Each seed and every growing system is unique, so we provide optimised protocols for each. We supply a remote management system which empowers collaborative working, enabling the user to work with Zayndu's biology teams to optimise the treatment protocol for the seed and their growing environment.

The management system also enables per-batch tracking of protocols applied to seeds, offering a high level of traceability.

Biosecurity Gateway

Many growers talk about "pathogen vectors" into Controlled Environment Agriculture facilities.

Pathogens can be carried in on water, air, growing media, people, or the seeds themselves. With proven reduction in pathogens, Zayndu's cold plasma systems reduce or eliminate seed borne pathogens - perhaps the most challenging pathogen vector.

