

RED AMARANTH

Zayndu Cold Plasma Treatment Report



Alberto Campanaro

Head of Plant Science

ATIC, Oakwood Drive,
Loughborough,
Leicester,
LE11 3QF,
UK

+44(0)1509 276225
a.campanaro@zayndu.com
www.zayndu.com



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RED AMARANTH

Amaranthus cruentus

Amaranth is one of the oldest grown crops. The leaves can also be eaten raw or cooked. The younger leaves particularly are mild and tender and, importantly, rich in antioxidants.

GROWN

Vertical Farms, Greenhouse, Open Field

GERMINATION

3-7 Days

HARVEST

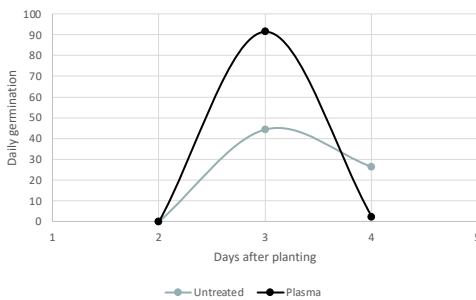
20-24 Days

Germination

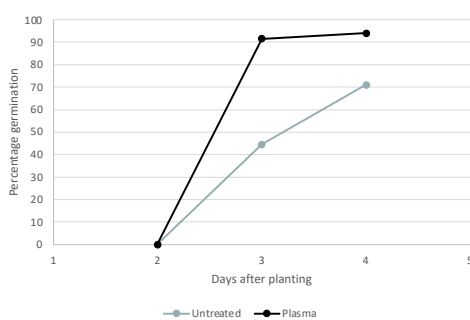
Total germination of the seeds improved significantly compared to the untreated seeds.



An increase from 75% to 94% was observed in this trial, saving both time (reduces cultivating seeds that fail) and money (reduces amount of seeds purchased).



In addition to increasing the total amount of successfully germinated seeds, the process also increased the speed of germination. 91% of treated seeds germinated 3 days after planting, 94% by day 4. In comparison 70% of untreated seeds germinated by day 4.



This improvement enables better prediction of harvestability, with the entire crop germinating within a shorter timeframe than untreated seeds.

Processing Details

Zayndu Model

Z10-1

Treatment Protocol

Z10-08x23AC

Required Activated Air treatment levels treatment levels reached within the laboratory, under standard operation conditions. Germination tests were carried out in accordance with industry standard operating procedures (ISTA protocols).

Caveats

This treatment protocol was not fully optimised and used an off-the-shelf protocol. There may have been scope for optimisations; additionally, as Zayndu are continuously improving their product range, it is likely that improved results could be achieved if these tests were re-run now. Please contact your sales rep if you'd like more details.

Summary

In this example, the treated seeds achieved a higher germination, in particular a 34% increase compared to the untreated controls. Total yield was calculated and preliminary results demonstrate around 30-40% uplift in productivity.

For more details or to arrange an evaluation please contact our team below

SEED EVALUATION

Zayndu operates a seed testing facility to demonstrate the performance of the Activated Air treatment on plant health and germination.

We generate quantitative data, comparing germination and growth rates for a seed batch before and after the treatment.

Seed testing is performed using highly sensitive tests within controlled environments and in accordance with the International Seed Testing Association's (ISTA) updated guidelines and protocols.

If you are interested in evaluating your own seeds for protocol optimisation and performance reporting, please contact our business development team on +44(0)1509 276225 or email sales@zayndu.com

- Germination analysis
- Growth rate evaluation
- Bespoke treatment optimisation



ZAYNDU SYSTEMS

- Advanced Seed Health Systems for CEA
- Cold plasma boosts seed health and crop yield
- Using only air and electricity, no added chemicals
- Options for 1kg and 2.5kg batch size
- Low operating power consumption (typically <200W)
- Designed for Vertical Farms & Greenhouses

Designed for the needs of vertical farms and greenhouses, Zayndu CEA systems are intended to support and improve crop productivity by boosting seed vigour without the need for additional fertilisers.

Harnessing the power of nature, the low energy Cold plasma systems re-create the natural phenomenon that is lightning (plasma) in a controlled environment and only require a standard office electric outlet (110V or 240V options).

Treatment costs are amongst the cheapest in the industry.

THE COLD PLASMA PROCESS

Zayndu's seed health process uses cold plasma to boost overall seed health. It is effectively a priming process, improving germination rates and speed, ensuring increased yield for the grower.

In the process, seeds are placed in a drum, containing only air. The Zayndu system generates cold plasma within the drum. This in turn creates "Activated Air", which is a blend of Reactive Oxygen and Nitrogen Species (or RONS for short). This delivers a boost to seed vigour. At the end of the process, the Activated Air is returned back to normal atmospheric air.

Process control is critical. Sensors measure humidity, temperatures, pressures, and gas concentrations throughout the system and use sophisticated control algorithms designed to deliver consistent results. The monitoring systems also highlight areas which may need maintenance in the future, helping to ensure that every treatment is done effectively.

The treatment is both cool and dry – no water is introduced in the process, and the advanced cold-plasma systems used ensure the seeds are not exposed to temperatures outside of 18-24°C.

