

# POPUL8™

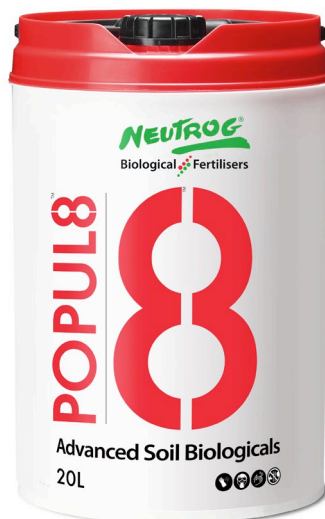


*The wide diversity of bacteria and fungi within POPUL8™ not only provides protection by filling the biological space in the soil but also stimulates and enhances healthy plant growth above and below ground.*



*Dr Uwe Stroehler*

Dr Uwe Stroehler  
R&D Manager,  
Neutrog Biological Fertilisers



**POPUL8™ is an Advanced Soil Biological Formula specifically developed and manufactured by Neutrog Australia.**

**POPUL8 is designed to populate and occupy the biological space in the soil and on plant roots which may otherwise be an available space for plant pathogens to inhabit...hence its name.**

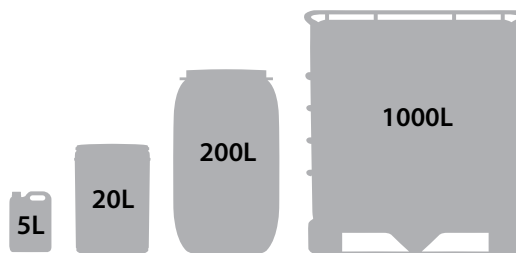
**POPUL8 contains a diverse microbiome of some 200+ naturally occurring microbes, plus a further 42 specifically selected bacteria and fungi have been isolated, identified and added for their individual and joint symbiotic purpose and beneficial characteristics.**

**The high number and wide diversity of microbes in POPUL8 have been chosen to maximise the range of functions POPUL8 can perform, including:**

- 1** Promote **Nutrient Cycling** from its microbiome of 200+ diverse bacteria and fungi known for their ability to break down organic compounds
- 2** **Liberate Nutrients** such as phosphorus, potassium and calcium from the inclusion of specific individual microbes
- 3** **Fix Nitrogen** from the inclusion of specific individual microbes that can fix up to 40kg of nitrogen, per hectare, per year
- 4** **Produce Plant Growth Hormones** such as auxins and gibberellins from the inclusion of specific individual microbes
- 5** **Protection & Resilience** against disease by filling the biological space that could otherwise be occupied by pathogens.
- 6** **Bio-Stimulation** through the inclusion of proteins, vitamins, amino acids, micro-nutrients, cellulose and fulvic and humic acids extracted from kelp, fish and leonardite

**POPUL8 is suitable for all plant types, all soil types and all locations.**

**POPUL8** can be supplied in 5L, 20L, 200L and 1000L quantities.

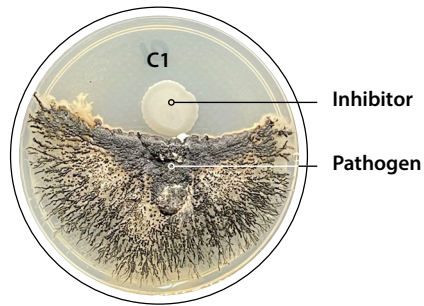


# POPUL8 LAB TESTS INHIBITION & SOLUBILISATION

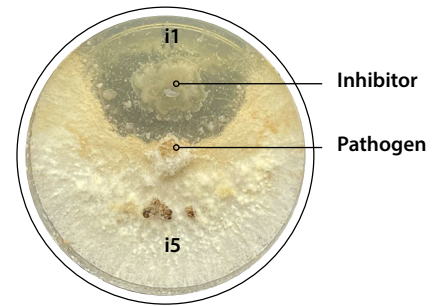
**POPUL8 contains a high number and wide diversity of specific purpose bacteria and fungi (microbes).**

These microbes have been individually chosen to maximise both the range of functions they are capable of performing as well as their ability to be effective in a broad spectrum of geographical locations and soil conditions.

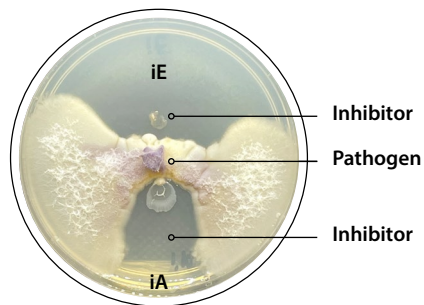
Shown below are actual examples of the tests performed by Neutrog's laboratory that demonstrate plant pathogen inhibition and suppression along with nutrient liberation. The bacteria in these tests are all included in **POPUL8**.



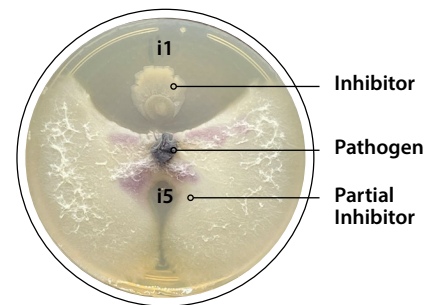
**Inhibition** of the pathogen *Colletotrichum coccodes* (Black Dot from potato) by bacterial isolate C1 but not C2 (which has been overgrown by the pathogen)



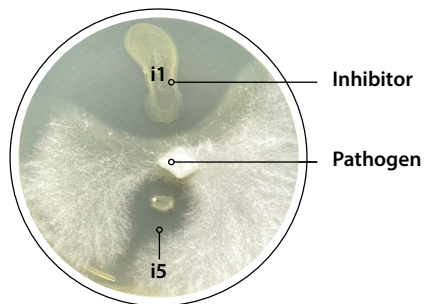
**Inhibition** of the pathogen *Rhizoctonia solani* (isolated from tomato) by bacterial isolate i1 but not i5



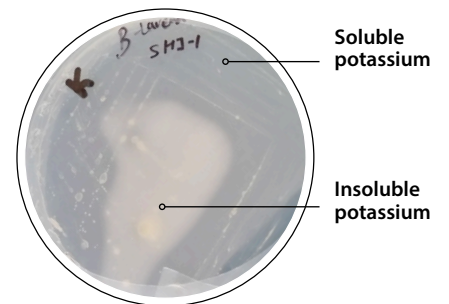
**Inhibition** of the pathogen *Pythium* (isolated from strawberries) by bacterial isolate iE and iA



**Inhibition** of the pathogen *Pythium* (isolated from strawberries) by bacterial isolate i1 and partial inhibition by i5



**Inhibition** of the pathogen *Sclerotinia sclerotiorum* (isolated from tomato) by bacterial isolates i1 and i5



**Liberation** of potassium by bacterial isolate SH1/S3/18/K

## THIS IS JUST THE BEGINNING

The 42 specific bacteria and fungi added to formulate the current **POPUL8™** product have been selected from a collection of some 500+ specific function microbes that Neutrog's R&D team, headed by Dr Uwe Stroehrer, have extracted from a vast number of soil samples from around Australia.

Neutrog's core philosophy is that it is not just about finding and including a single bacteria or fungi that is the best performer of a specific function, but rather to gather a diversity of those microbes that best carry out a specific function in a variety of soil conditions. This approach provides the optimum opportunity for the microbes in **POPUL8** to proliferate and perform, no matter what the geographical area or soil conditions.

As new specific function microbes are discovered, they will be assessed against those existing within **POPUL8** and if they perform better or in a wider variety of soil conditions, they will become either an additional microbe or they will replace an existing one.

Furthermore, as Neutrog's research increases, there is significant potential to expand the functionality of **POPUL8** to include microbes that increase tolerance to Abiotic (drought) stress and others that can reduce, if not remove, salinity stress.

## TABLE8

**POPUL8** is the first release from Neutrog's new product range **TABLE8**.

The origin of the **TABLE8** range is an analogy often used by Dr Uwe Stroehrer.

If you were to have a dinner party and all the seats are taken, there is no room left for gate crashers to sit - in a similar manner, if all the available biological space is taken up by good bacteria, there is no place for pathogenic bacteria to inhabit...hence **TABLE8**.

There are already a number of other biological products under development which will be released under the **TABLE8** banner - these include **BIOVAX8**, specifically including a diverse range of microbes known for their ability to inhibit and suppress pathogenic bacteria. Plus **LIBER8** specifically including a diverse range of microbes known for their ability to liberate nutrients.





## ABOUT DR UWE STROEHER

Dr Uwe Stroehler graduated with a Ph.D in Microbiology from the University of Adelaide where he remained for a further six years working as a research scientist. In 1988, he was awarded the prestigious Alexander von Humboldt Research Fellowship and subsequently spent over two years working in Germany.

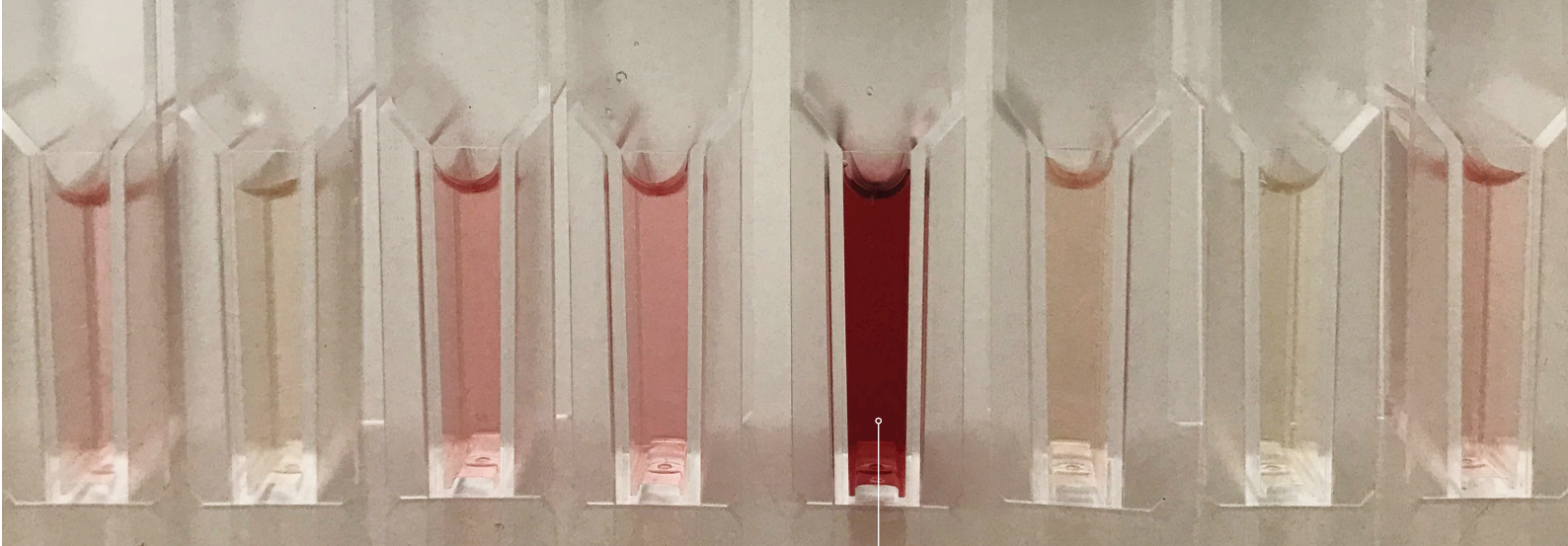
On his return to the University of Adelaide, he worked on *Streptococcus pneumoniae* before moving to the Hepatitis Research Laboratory. A move to Flinders University marked the beginning of his work on the super bug *Acinetobacter baumannii* and also the use of clean technology to enhance chemical compounds.

During his research career Dr Stroehler published over 40 peer reviewed journal articles.

Over the last 25 years, Dr Stroehler has had a keen interest in soil microbiology and in bioremediation, which led to an immediate interest in consulting to Neutrog on the development of GOGO Juice in 2005. This consultancy extended for the development of Litterbugs (to be marketed and sold as LITTERM8) an ammonia liberating biological for use in commercial animal bedding and potential application in cat litter.

In 2016, Dr Stroehler joined Neutrog full to head up the R&D program.





**TGB15** There are six auxin producers in **POPUL8** including isolate TGB15 which produces approximately 130mg/l of auxin which is considerably higher than most reported auxin producing strains.

## POPUL8 LAB TESTS AUXINS

**POPUL8 contains six individual auxin producers. Auxins are produced by plants and soil bacteria.**

In plants, auxins are produced in both the apical tip as well as in the roots. Auxins are best known for their role in root development, but they also help in regulating the plants shape, stem elongation and their ability to bend towards the light.

In soil, auxins are produced by bacteria and are valuable for their capacity to regulate bacterial growth and as a way for differing bacteria to communicate. Plants take advantage of the auxin produced by soil bacteria to enhance their own root development, thus soil inoculants which contain auxin producing bacteria can boost and accelerate the plant root growth.

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### INSTRUCTIONS FOR USE

1. Shake well before use
2. **POPUL8** must be diluted before use. Dilute at a rate of 1:100 however the higher the dilution the better
3. Use 5L per hectare of **POPUL8** as a spray application or through fertigation
4. Spray or apply during low UV or prior to a rain event if possible (UV or extreme hot and dry conditions will kill many microbes).
5. If possible (and applicable), water in after application.

### SAFETY DIRECTIONS

**POPUL8** is produced from natural products and will naturally contain a variety of living micro-organisms. Not to be taken. Keep out of reach of children. May irritate skin and eyes. Avoid inhalation. Use in a well-ventilated space. Wash hands after use. If splashed, wash off with water. If swallowed seek prompt medical advice. Additional information provided in the Safety Data Sheet.



### STORAGE AND HANDLING

Store in a cool place (<30C) away from direct sunlight. Do not mix with fungicides or bactericides. Use diluted **POPUL8** within one (1) week of dilution. Re-agitate if the diluted product has been left standing for an extended period. Use safe work practices for lifting and handling.