



Radiata pine pollen

New Zealand planted forest environmental facts.

Radiata pine forests in New Zealand produce large clouds of pollen every spring. This pollen may concern people who suffer from allergies.



Right: Pollen catkins on the end of pine branches.
Left: Pollen grain section viewed under a microscope.

What is pollen

Pollen is produced by plants as part of their reproductive cycle. Billions of pollen grains are released into the atmosphere by the catkins, or the flowering parts, of pine trees.

Pollen is carried by wind. When it lands on a compatible female pine catkin pollination, or fertilisation, takes place. The tree then produces pine cones filled with seeds.

Pollen Production

Pine pollen is produced over a few weeks in late winter and early spring. If you live downwind of a pine forest then it is inevitable you will get a cloud of pollen colouring the puddles and coating your car at some stage in this period.

Low health risk

Research shows that the pollen produced by pine trees causes an allergic reaction in less than 5% of people. It is more often an irritant. This could have something to do with the relatively large pollen grains carrying few proteins and having a waxy coating. The pollen grains do not penetrate as deeply into nasal passages as smaller pollen types, and the wax protects the proteins leaking out.



Other tree species such as wattles (pictured above) or silver birch release pollen at the same time of the year as pines. Their spiky pollen grains can be much more allergenic. It is possible that people suffering from allergies are reacting to these pollens.

Frequently asked questions

- **Make up of pine pollen.** The chemical composition of pollens is not well understood or easily analysed. Pollen grains are complex. They have a hard shell for protection

and contain a range of organic chemicals – proteins, lipids, carbohydrates and nucleic acids.

- **Why pine pollen is yellow.** It contains compounds called flavonoids that can be also be orange or red. Flavonoids protect the pollen from the sun's UV-B radiation and prevent deformities in seeds produced with the pollen.
- **Pine pollen volume.** A mature *Pinus radiata* tree can produce between 0.5 and 0.75 kilograms of pollen each year. At a typical 400 trees per hectare this is equivalent to up to 300 kilograms per hectare per year.
- **Pine pollen spread.** Wind spread pollen travels less than 700 metres but in windy areas it will travel further. In the US, pollen has been found 300 kilometres from its source. Pollen that enters waterways can also travel long distances. It is ubiquitous in near-shore marine sediment and has been found far offshore in the Tonga and Kermadec Trenches.
- **Unlikely to damage paintwork.** There is no evidence that pollen will corrode paintwork on your car or house. However, it is a good idea to wash pollen as it can gradually clump together and stick to the paint surface.
- **Does not damage the environment.** Pine pollen is not toxic. It breaks down relatively quickly in the environment. Concerns that pine pollen is a cause of nitrogen build-up in waterways are unfounded. Nitrogen contributed to waterbodies is very low and for a short time only given the brief pollen season.
- **Uses of pollen in geology, archaeology, and crime fighting.** Pollen grains from different plant species have unique sizes and shapes. These characteristics have been used in geological studies to reconstruct what types of plants existed in different geological periods. Analysis of pollen in sediment in lakebeds has been used to understand past land uses. Likewise, pollen records will give archaeologists information about the crops and culture of ancient human settlements. Criminals have been convicted on the evidence of matching pollen on their clothing with pollen at the crime scene.

Key links and references

Pollen allergy and cross-reactions in New Zealand.

http://www.allergyclinic.co.nz/pollen_allergy.aspx

<http://www.allergy.org.nz/A-Z+Allergies/Pollen+allergy.html>

<http://www.dermnetnz.org/topics/radiata-pine>

Fountain, D.W. Cornford C.A. 1991. Aerobiology and allergenicity of *Pinus radiata* pollen in New Zealand. *Grana*. 30:1. 71-75. DOI:10.1080/00173139109427773

Effect of pollen on lakes water quality

<http://www.rotorualakes.co.nz/vdb/document/135>