

## Rust Fungus on Plants

**Dry Season / Rainy Season:** In the tropics, temperatures are fairly uniform year round and seasonal changes are not nearly as pronounced as farther north or south of the equator. Instead of temperature, precipitation defines the seasons, and there are only two of them: the dry season, which locals often call summer, and the rainy season, which is often called winter. The rainy season begins around mid-May and lasts until October or November, interrupted by a short dry period of about two weeks in late July or early August. During the dry season – December to May; a typical month has about three or four rainy days, particularly at the beginning of the dry season.

**Infection:** “Rust” refers to the characteristic reddish/ orange blisters (known as “pustules”) produced on the infected leaves and stems of host plants. Once they become established, they can be difficult to control. The fungi that cause rust diseases are obligate parasites that need living plants to survive. Host plants are rarely killed, but their overall plant health and appearance is adversely impacted. With severe infections, leaf blighting and premature drop occur. Infection only occurs through stomata on the underside of the leaf and cause significant damage to the plants by reducing the photosynthetic area of plants.

Urediniospores germinate only in the presence of free water (rain or heavy dew); high humidity alone is not enough. The whole process of infection requires about 24 to 48 hours of continuous free moisture, so while heavy dew is enough to stimulate Urediniospores germination, infection usually occurs only during the rainy season. The seasonal variation in disease incidence is primarily due to variation in rainfall. Where there are two rainy seasons per year, there are two peaks in severity of rust. Infection occurs over a wide range of temperatures (15°C/ 59°F to 28°C/ 82°F) and optimum at 22°C/ 72° F.



underside of leaf



top side

**Fungicides:** On susceptible varieties and in environments favorable for the fungus, fungicides are important tools in the management of rust epidemics. **FUNGAL MANAGEMENT PROGRAM:** In deciding when, what, and how to spray, any given fungicide application has to be considered a long-term investment, with effects not only in the current season but in future seasons as well. The timing of the applications and the coverage are important. As a general rule, the intervals between sprays should be less than 21 days to be sure to keep new growth covered. Forecast models exist for timing of fungicide applications, according to temperature and rainfall. Since infection occurs on the undersides of the leaves, the sprays should be directed upward to cover the lower leaf surfaces.

We have found that in some cases it takes a few applications to see full results. Patience is needed when the problem is vast and needs time. The observations listed above are from experience and making initial errors, around the world, based on our own unique results and experiences. All plants are different; every environment is different; every operator is different. We cannot guarantee you will see any specific result listed above. However, raising the oxygen levels of the plants, soil, and water with our products, will enable the elimination of the fungus that causes rust. We strongly believe in prevention; do not wait until a problem develops; prevent it before it gains a stubborn foothold. **PREVENTION is the Best Solution.**

*If this makes sense to you, please give us a call; we would love to have you as a customer.*

Tel: (604) 826.8368  
T/F: (866) 466.8252  
Fax: (877) 360.8368  
E-mail: [info@puroxi.com](mailto:info@puroxi.com)

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IS OUR PASSION!**



*Caution: Bacteria and contaminants are everywhere. Your seeds need to be disinfected, however we do not suggest over soaking your seeds for long periods of time.*

# PUROXI

WATER Treatment  
for PLANTS, CROPS  
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PURE WATER GLOBAL INC.

## Building Blocks of Water (& Life!)

$H_2O = 2$  molecules of Hydrogen + 1 molecule of Oxygen

### Hydrogen:

Hydrogen makes up 90% of the matter in the known Universe. Without hydrogen to combine with oxygen, we wouldn't have water. Water is formed when hydrogen is burned by oxygen. We create pure water every day as a product of our metabolism. When we burn hydrogen in our cells, the energy that is released is used to run our bodies.

Oxygen burns hydrogen in the living system, releasing the energy that runs our bodies. **Hydrogen is "the fuel of life"** and is essential to most biological processes in its atomic form, including hydrating our cells. In the absence of an adequate supply of hydrogen, intracellular function, inter-cellular communication and energy production are inhibited; toxins and free radicals accumulate and health deteriorates."

### Oxygen:

Oxygen acts as a disinfectant, deodorizer, sanitizer & preserver. All functions of our body are regulated by oxygen. It must be replaced on a moment to moment basis because 90% of our life energy depends on it.

Oxygen energizes cells so they can regenerate. Our body uses oxygen to metabolize food and to eliminate toxins and waste through oxidation. Our brain needs oxygen each second to process information. In fact, all of our organs need a great deal of oxygen to function efficiently. The ability to think, feel, move, eat, sleep and even talk all depends on energy generated from oxygen. **Oxygen is 'the Life-Giver'**

Oxygen is the only element capable of combining with almost every other element to form the essential components necessary to build and maintain our bodies. The combination of oxygen in the air, water, proteins and carbohydrates creates life energy. **Without oxygen there would be no life**

### Water - the 'Ocean of Life'

All chemical reactions in the body take place in water. Every cell in the body is bathed in water, which contains materials to keep them vibrant.

Water is the transporter of nutrients and **oxygen** for proper function of the body's tissues; it helps remove waste from the body; it acts as a natural air conditioner through perspiration; it's essential for digestion and absorption of vitamins and minerals. Water keeps our skin moist and supple, and is a natural lubricant for our joints and internal organs. It is involved in every one of our bodily functions, so it's hardly surprising that dehydration can lead to mental and physical breakdown. Over the course of an average day, the body loses approximately three quarts of water through breathing, perspiration and elimination. This fluid must be replaced or muscle cramping, dehydration, or heat stroke may take place.

The growing pollution in our modern day world is having an increasingly detrimental effect on our drinking water, and consequently on overall health. Hazardous chemicals like mercury, lead, arsenic, cyanide, aluminum, phosphorus, and pharmaceuticals are getting into the water system every day, along with chlorine and fluoride, added by municipalities to treat water. E-coli, total coliforms, iron, lead, manganese, nitrates, nitrites, sodium, sulphates, and total dissolved solids, further add to the load of toxins that our bodies try to eliminate.

**Without water to carry oxygen and other vital nutrients, life could not exist**

