

TECHNICAL DATA SHEET

Product Name	VIRUMIN (CURCUMIN 1.9 %)
Manufactured By	KATRA FERTILIZERS & CHEMICALS PVT. LTD.
Factory Address	Survey No. 90/2/1, Gram Mehrja, Khandwa Road, Khargone, Madhya Pradesh, 451001 India
Office Address	Corp. Office: 1304, Marathon Icon, Nextgen Campus, Opp. Peninsula Corporate Park, Lower Parel (West), Mumbai- 400013 India

General Information

VIRUMIN is based on turmeric Extract containing 1.9 % **Curcumin**. Curcumin, the most important bioactive component of turmeric has been shown to have a wide spectrum of biological actions including **antibacterial, antiviral, antifungal, antioxidant, insect repellent, Stress Tolerance, Bio-stimulant** and healing properties. Bio active compound **Virumin (Curcumin)** also have insecticidal properties, with Curcumin being the most active chemical and acting as a natural Bio-stimulant. The activity of Virumin makes it appropriate environment friendly vector control agent.

❖ **Virumin has strong antiviral and antibacterial properties, making it an effective natural virucide and bactericide for plants. Here's how it benefits plants in disease prevention and control:**

❖ **Benefits of Virumin as a Virucide:**

- **Inhibits Virus Multiplication:** Virumin interferes with viral replication, reducing the spread of plant viruses like tobacco mosaic virus (TMV), cucumber mosaic virus (CMV), and tomato yellow leaf curl virus (TYLCV).
- **Strengthens Plant Immunity:** It activates Systemic Acquired Resistance (SAR), triggering the plant's natural defense system to resist viral infections. Enhances production of defensive proteins that block virus entry and movement within plant tissues.
- **Destroys Viral Particles:** Virumin binds to viral proteins and RNA, destabilizing the virus and making it inactive before it can infect new cells. Disrupts viral lipid membranes, preventing viruses from attaching to plant cells.

❖ **Benefits of Virumin as a Bactericide**

- **Kills Harmful Bacteria:** Virumin has strong antibacterial effects against plant pathogens like Xanthomonas, Pseudomonas, and Erwinia, which cause diseases like bacterial wilt, blight, and soft rot.
- **Inhibits Bio-film Formation:** Many plant bacteria form bio-films to protect themselves. Virumin disrupts bio-film formation, making bacteria more vulnerable to plant defenses and natural bio-control agents.
- **Reduces Antibiotic Resistance:** Unlike chemical antibiotics, Virumin does not promote bacterial resistance, making it a sustainable solution for bacterial disease control.
- **Protects Soil Micro-biomass:** Unlike synthetic bactericides that kill both harmful and beneficial bacteria, Virumin selectively targets pathogens while preserving beneficial microbes, improving overall soil health.

❖ **Virumin, when used as a bio-stimulant, can enhance plant growth, stress tolerance, and overall productivity through natural, non-nutrient-based mechanisms. Here are the key benefits of Virumin as a bio-stimulant in agriculture:**

- **Enhances Plant Growth and Development:**
 - * Stimulates root growth, leading to better nutrient and water uptake.
 - * Promotes seed germination and early seedling vigor.
 - * Enhances cell division and elongation, improving plant biomass.
- **Boosts Stress Tolerance:**
 - * **Drought & Heat Resistance:** Virumin enhances antioxidant activity in plants, reducing oxidative damage during heat and Drought stress.
 - * **Salt Tolerance:** Helps plants maintain ionic balance under saline conditions, reducing salt stress damage.
 - * **Heavy Metal Detoxification:** Virumin chelates (binds) heavy metals like lead and cadmium, reducing their toxic effects on Plant metabolism.
- **Improves Disease Resistance:**
 - * Activates the plant's Systemic Acquired Resistance (SAR), strengthening immunity against bacterial, fungal, and viral infections.
 - * Works as a natural antimicrobial agent, reducing the need for chemical fungicides.

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- **Enhances Nutrient Absorption:**
 - * Improves microbial activity in the soil, promoting beneficial bacteria and fungi that aid nutrient solubilization.
 - * Increases bioavailability of essential nutrients like nitrogen, phosphorus, and potassium.
 - **Acts as a Natural Growth Regulator:**
 - * Influences plant hormones such as auxins, gibberellins, and cytokinins, leading to balanced growth and development.
 - * Delays leaf senescence, extending the productive life of plants.
 - **Promotes Sustainable Agriculture**
 - * Being eco-friendly and biodegradable, Virumin (Curcumin) based bio-stimulants reduce reliance on synthetic agrochemicals.
 - * Helps maintain soil health, improving long-term agricultural productivity.
- ❖ **Virumin's multifunctional benefits as a Bio-stimulant make it a promising addition to sustainable farming practices. It could be marketed as a natural, eco-friendly plant enhancer.**
- ❖ **How Virumin Can Be Used in Plant Protection**
- Foliar Spray: Prevents viral and bacterial infections on leaves.
 - Soil Drench: Controls soil-borne bacterial pathogens affecting roots.
 - Seed Treatment: Protects seeds from bacterial and viral infections before germination.

OTHER BENEFITS :

- **Natural Pest Repellent:** Act as a bio-pesticide by repelling or inhibiting insect pests, reducing the need for chemical pesticides.
- **Antioxidant Effects:** It has strong antioxidant properties, which can help plants combat oxidative stress caused by environmental factors like drought, salinity, and extreme temperatures.
- **Soil Health Improvement:** When added to soil, it supports beneficial microbial activity, enhancing nutrient availability and improving soil structure.
- **Defense Activation:** Trigger plants' natural defense mechanisms (Systemic Acquired Resistance), making them more resistant to diseases and pests.
- **Heavy Metal Detoxification:** Help plants tolerate heavy metal stress by binding with toxic metal ions, preventing them from harming plant cells.

Mode of Action:

The activity of Virumin (Curcumin) is achieved through multiple pathways, including cell wall attachment, entry, protein replication, and direct virus killing. Clearly, curcumin's activity mechanism spans the entire course of invasion and proliferation, with considerable direct impact.

Physical Properties		Target Crops	
Physical appearance	Liquid	It is recommended for all types of crops like: Cereals, Millets, Pulses, Oil Seeds, Fibre Crops, Sugar Crops, Forage Crops, Plantation Crops, Vegetables, Fruits, Spices, Flowers, Medicinal Crops, Aromatic Crops, Orchards & Ornamentals.	
Colour	Dark Yellowish Brown		
Solubility in water	Water soluble		
Specific gravity	1±0.1		
Ph	6±1		
Chemical Property		Storage	Compatibility
Curcumin	1.9 % w/w	It Is Stable For A Period Of 24 Month From The Date Of manufacturing If It Is Kept Under Normal Storage Condition.	It Is Compatible With Bio-Pesticides & Conventional Chemical Pesticides & Also Enhances Their Efficacy.
Mode Of application	Foliar Spray		

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