

## Electrolyzed Water Offers Sustainable Alternative to Chemical Pesticides



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Multan, October 19— Researchers from the Institute of Plant Protection, MNS-University of Agriculture, Multan have highlighted electrolyzed water as a promising innovation for pesticide-free and sustainable farming. The study, led by Dr. Akhtar Hameed and Muhammad Umair Rafiq, describes electrolyzed water as an eco-friendly, affordable, and highly effective method to control crop diseases while improving soil health and food safety.

Electrolyzed water is produced by passing an electric current through a mild salt solution such as sodium chloride. This process generates two types of water: Electrolyzed Oxidizing Water (EO Water), which is acidic with strong antimicrobial properties, and Electrolyzed Reducing Water (ER Water), which is alkaline and beneficial for plant growth. The oxidizing water contains hypochlorous acid (HOCl) and reactive oxygen species (ROS) that destroy harmful bacteria, fungi, and viruses. Meanwhile, the reducing water helps neutralize oxidative stress in fruits and vegetables, extending their shelf life and delaying spoilage.

The researchers emphasized that electrolyzed water leaves minimal residues compared to chemical pesticides, making it a safer option for both consumers and the environment. It also promotes soil health by suppressing soil-borne pathogens like *Fusarium solani* and *Rhizoctonia solani*, enhancing nutrient availability and microbial balance.

Countries such as China and the United States have already adopted this technique successfully, reducing pesticide use in greenhouse farming by nearly 50 percent. The team urged Pakistani agricultural institutions to develop low-cost electrolyzed water generators and promote their use among local farmers.

Dr. Hameed noted that “sustainability in agriculture begins with affordability and awareness.”

The researchers called on the government and agricultural extension departments to organize training programs and awareness campaigns for farmers to replace synthetic pesticides with this green technology.

By adopting electrolyzed water in pest management and soil treatment, Pakistan can move toward achieving global food safety standards and strengthen its position as a regional leader in sustainable agriculture.