

Evaluating benefits of Electrolysed Water on various crops and industry.

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Wheat

Benefits of Electrolysed water application to Wheat

Electrolysed water (EW) is a technology that involves the use of electric current to convert ordinary water into two separate solutions: an alkaline solution (catholyte) and an acidic solution (anolyte). These solutions have been found to have various applications in agriculture, including the treatment of crops such as wheat. Here are some benefits of electrolysed water application to wheat:

1. **Disease Control:** Electrolysed water has been found to have antibacterial and antifungal properties that can help control various plant diseases. By spraying wheat crops with electrolysed water, farmers can effectively control fungal diseases such as **Fusarium head blight**, which can reduce yields and cause economic losses.
2. **Improved Quality:** Electrolysed water has been shown to improve the quality of wheat grains by reducing the levels of **mycotoxins**, which are toxic substances produced by fungi. By reducing mycotoxin levels, electrolysed water treatment can help increase the value of wheat grains for use in food and other products.
3. **Reduced Pesticide Use:** By using electrolysed water to control diseases, farmers can reduce their reliance on synthetic pesticides, which can be harmful to the environment and human

health. This can help reduce the **environmental impact** of wheat farming and improve the safety of food products.

4. **Increased Yield:** Studies have shown that the application of electrolysed water can help increase wheat yields by improving plant growth and reducing disease incidence. This can lead to higher profits for farmers and a more sustainable food supply.
5. **Cost-Effective:** Electrolysed water technology is relatively simple and cost-effective, requiring only water, salt, and electricity to produce. This makes it an attractive alternative to conventional chemical treatments, which can be expensive and complex.

In summary, the application of electrolysed water to wheat can provide a range of benefits, including disease control, improved quality, reduced pesticide use, increased yield, and cost-effectiveness.

Canola

The application of electrolysed water to canola crops can have several benefits, including:

1. **Pest and disease control:** EOW has been shown to be effective against various pests and pathogens that can affect canola crops, including **powdery mildew, Fusarium wilt, and Sclerotinia**. By using EOW to spray canola crops, farmers can reduce the need for chemical pesticides and fungicides.
2. **Improved growth and yield:** ERW has been shown to have a beneficial effect on plant growth and yield. When applied to canola crops, ERW can increase the number of **pods per plant**, the number of seeds per pod, and the **weight of the seeds**.
3. **Reduced environmental impact:** The use of electrolysed water can reduce the environmental impact of crop production by reducing the need for chemical pesticides and fertilizers. This can also lead to improved soil health over time.
4. **Cost-effective:** Electrolysed water is relatively easy and inexpensive to produce, and its application can reduce the need for expensive chemical inputs. This can make it an attractive option for farmers who are looking to reduce their costs while still maintaining high yields and quality.

Overall, the application of electrolysed water to canola crops can have several benefits, including improved pest and disease control, increased growth and yield, reduced environmental impact, and cost-effectiveness

Barley

Electrolyzed water (EW) is a type of water that has been treated with an electrical current, resulting in the formation of different types of water with varying properties. There are two types of electrolyzed water: acidic and alkaline. **Both types** have been shown to have potential applications in agriculture, including for the control of leaf diseases in crops such as barley. Here are some potential benefits of using electrolyzed water for leaf disease control in barley:

1. Effective against a broad spectrum of pathogens: Both acidic and alkaline electrolyzed water have been shown to have antimicrobial properties and can be effective against a broad spectrum of plant pathogens, including bacteria, fungi, and viruses that cause **leaf diseases** in barley.
2. Non-toxic and environmentally friendly: Electrolyzed water is non-toxic, environmentally friendly, and does not leave any harmful residues on crops or soil. This makes it a **safe alternative** to chemical pesticides that can be harmful to humans, animals, and the environment.
3. Easy to use: Electrolyzed water can be applied to barley leaves using a variety of methods, including spraying, fogging, and soaking. It is also easy to prepare and can be generated on-site using a small-scale electrolysis system.
4. Cost-effective: Electrolyzed water is a cost-effective alternative to chemical pesticides, as it can be generated on-site and does not require expensive equipment or specialized training to use.
5. Potential **for increased crop yields**: By controlling leaf diseases in barley, electrolyzed water has the potential to increase crop yields and improve crop quality, which can benefit farmers and consumers alike.
6. **Extension of shelf life**: By reducing microbial contamination, electrolyzed water can help extend the shelf life of barley. This is

especially important in the storage and transportation of barley, where microbial growth can occur rapidly.

7. **Improved germination:** Barley is often used for brewing beer or for animal feed, and in both cases, good germination is essential. Electrolyzed water has been shown to improve the germination rate of barley, leading to better yields and quality of the final product

Overall, the application of electrolyzed water for leaf disease control in barley has many potential benefits, including effectiveness, safety, ease of use, cost-effectiveness, and the potential for increased crop yields. However, further research is needed to optimize the application of electrolyzed water and to evaluate its long-term effects on crop health and soil quality.

Peas

There are several potential benefits of using electrolysed water in field peas production:

1. **Disease control:** Electrolysed water has been shown to be effective against various plant pathogens, **including fungi, bacteria, and viruses**. By treating field peas with electrolysed water, farmers may be able to reduce the incidence and severity of plant diseases, resulting in **higher yields and better quality** peas.
2. **Improved seed germination:** Soaking field pea seeds in electrolysed water may improve their germination rates and enhance seedling vigor. This can lead to more uniform and faster plant emergence, which can help farmers achieve higher yields.
3. **Reduced chemical use:** By using electrolysed water as a natural sanitizing agent, farmers may be able to reduce their reliance on chemical disinfectants, which can be costly and potentially harmful to the environment.
4. **Increased shelf life:** Electrolysed water has been shown to extend the shelf life of fresh produce by reducing microbial growth and spoilage. By treating field peas with electrolysed water before storage or shipping, farmers may be able to extend the shelf life of their product, reducing waste and increasing profitability.

Overall, the use of electrolysed water in field peas production has the potential to improve plant health, increase yields, reduce chemical use, and improve post-harvest quality. However, more research is needed to fully understand the optimal application methods and concentrations for different crop and pathogen combinations.

Lentils

Electrolyzed water (EW) is a type of water that has been treated with an electrical current, which changes its chemical composition. It has been shown to have several benefits in agriculture, including its application in lentils. Some potential benefits of electrolyzed water application in lentils include:

1. **Reduction of pathogens:** EW has antimicrobial properties, which means it can reduce the presence of harmful microorganisms on the surface of lentils. This can help to reduce the risk of foodborne illness and increase food safety.
2. **Extended shelf life:** By reducing the number of microorganisms on the surface of lentils, EW can help to extend their shelf life. This can be particularly important for farmers and distributors who need to transport lentils over long distances.
3. **Improved germination:** EW has been shown to improve seed germination rates in some crops. In lentils, this could potentially lead to higher yields and better crop quality.
4. **Reduced chemical use:** Because EW has antimicrobial properties, it may be possible to reduce the use of chemical pesticides and other treatments in lentil production. This can be both cost-effective and environmentally friendly.
5. **Increased nutrient uptake:** Some studies have suggested that electrolyzed water may help to improve the uptake of nutrients in plants. This could potentially lead to healthier and more robust lentil plants, with higher yields and better nutritional content.

Overall, the application of electrolyzed water in lentil production has the potential to offer several benefits, including improved food safety, extended shelf life, and increased crop yields

Oats

Electrolysed water solution contains reactive species such as hypochlorous acid, which has been shown to have several benefits when applied to oats. Some of the benefits of electrolysed water application in oats include:

1. **Improved shelf-life:** Oats treated with electrolysed water have been shown to have an extended shelf-life due to the antimicrobial properties of the solution. The hypochlorous acid in the solution has been shown to effectively reduce the growth of bacteria, yeast, and mold that can cause spoilage in oats.
2. **Reduced mycotoxin** contamination: Mycotoxins are toxic substances produced by fungi that can contaminate crops such as oats. Electrolysed water has been shown to effectively reduce mycotoxin contamination in oats, thereby increasing the safety of the product.
3. **Enhanced germination:** Electrolysed water can enhance the germination of oats, resulting in more uniform and faster sprouting. This is due to the beneficial effects of the solution on seed vigor and seedling growth.
4. **Improved quality:** Oats treated with electrolysed water have been shown to have improved quality, including increased protein content and reduced levels of free fatty acids, which can contribute to rancidity and off-flavors.
5. **Environmentally friendly:** Electrolysed water is an environmentally friendly alternative to traditional chemical treatments, as it does not leave behind any harmful residues or byproducts.

Overall, the application of electrolysed water in oats can provide several benefits, including improved shelf-life, reduced mycotoxin contamination, enhanced germination, improved quality, and environmentally friendly processing.

Potatoes

Here are some of the potential benefits of using electrolysed water on potatoes:

1. Improved plant growth and yield: Studies have shown that the application of electrolysed water can improve plant growth and yield in crops, including potatoes. The alkaline electrolysed water is thought to enhance nutrient uptake by the plant, leading to improved growth and yield.
2. Reduced disease incidence: The acidic electrolysed water has been shown to have antimicrobial properties, which can help to reduce disease incidence in potato crops. This is particularly relevant for soil-borne diseases, such as potato scab and blackleg.
3. Reduced pesticide use: The use of electrolysed water has the potential to reduce the need for pesticides in potato crops. This is because the antimicrobial properties of the acidic electrolysed water can help to control pests and diseases.
4. Reduced environmental impact: The use of electrolysed water as a crop treatment has the potential to reduce the environmental impact of conventional pesticide use. This is because electrolysed water is non-toxic and does not leave harmful residues in the soil.
5. Improved food safety: The use of electrolysed water as a crop treatment has the potential to improve food safety by reducing the risk of contamination with harmful microorganisms, such as E. coli and Salmonella.

Overall, the application of electrolysed water on potato crops has the potential to improve plant growth and yield, reduce disease incidence and pesticide use, reduce environmental impact, and improve food safety.

Garbanzo Beans

Electrolyzed water is a type of water that has been electrically charged to produce a powerful disinfectant that can be used in a variety of applications, including agriculture. When applied to crops like Garbanzo beans, electrolyzed water has several potential benefits:

1. **Pathogen control:** Electrolyzed water has been shown to effectively control a variety of plant pathogens, including bacteria, fungi, and viruses. This can help prevent crop diseases and reduce the need for chemical pesticides.
2. Improved germination: Soaking Garbanzo beans in electrolyzed water before planting may improve seed germination rates, leading to higher crop yields.
3. Increased nutrient uptake: Electrolyzed water may help to break down soil nutrients into forms that are more easily absorbed by Garbanzo bean roots, leading to improved growth and yield.
4. Reduced chemical use: By using electrolyzed water instead of chemical pesticides and fertilizers, farmers can reduce their environmental impact and potentially improve the quality of their crops.
5. Extended shelf life: Treating Garbanzo beans with electrolyzed water can help to control post-harvest spoilage and extend their shelf life.

Overall, electrolyzed water application in Garbanzo bean crops has the potential to improve crop health, increase yield, and reduce the need for chemical inputs, leading to more sustainable and environmentally friendly agriculture.

Electrolyzed water has been shown to effectively control a variety of plant pathogens, including:

1. Bacteria:

- *Xanthomonas campestris*
- *Pseudomonas syringae*
- *Erwinia carotovora*
- *Ralstonia solanacearum*
- *Clavibacter michiganensis*
- *Agrobacterium tumefaciens*

2. Fungi:

- *Fusarium oxysporum*
- *Botrytis cinerea*
- *Phytophthora capsici*
- *Colletotrichum acutatum*
- *Sclerotinia sclerotiorum*
- *Alternaria alternata*
- *Mycosphaerella fragariae*

3. Viruses:

- Tobacco mosaic virus
- Tomato spotted wilt virus
- Cucumber mosaic virus
- Potato virus Y
- Watermelon mosaic virus
- Lettuce mosaic virus

Insects

Electrolyzed water can be effective in controlling a wide range of insects, including ants, bed bugs, cockroaches, fruit flies, house flies, mosquitoes, and spider mites. Electrolyzed water is a type of disinfectant that is produced by passing an electrical current through a solution of salt and water. The resulting solution contains hypochlorous acid, which is a powerful oxidizing agent that can kill bacteria, viruses, and fungi, as well as insect pests.

Electrolyzed water can be used in a variety of ways to control insect pests. For example, it can be sprayed directly onto surfaces where insects are present, such as countertops, floors, and walls. It can also be used as a fogger or misting system to treat larger areas. Electrolyzed water can also be used as a cleaning agent to remove insect attractants, such as food residues and spills, from surfaces.

While electrolyzed water can be effective in controlling insect pests, it is important to note that it may not be suitable for use in all situations. For example, it may not be effective against certain types of insects, such as those that burrow into wood or soil. Additionally, electrolyzed water may be corrosive to certain materials, such as metals and fabrics, and may require special handling and storage procedures. It is important to follow the manufacturer's instructions carefully and to use appropriate safety precautions when using electrolyzed water to control insect pests.

Micro Nutrients

Yes, electrolyzed water can be used to carry micro-nutrients into plants. Electrolyzed water is created through the process of electrolysis, which involves passing an electric current through a solution of water and salt. This process creates two types of water: acidic and alkaline. The acidic water can be used as a disinfectant, while the alkaline water can be used to promote plant growth.

Micro-nutrients, such as iron, manganese, and zinc, are essential for plant growth and can be added to the alkaline electrolyzed water to create a nutrient-rich solution. This solution can then be used to water plants, allowing the micro-nutrients to be absorbed by the roots and distributed throughout the plant.

It's important to note that the pH of the electrolyzed water may affect the availability of certain nutrients, so it's important to monitor the pH and adjust it if necessary. Additionally, the concentration of the nutrient solution should be carefully controlled to avoid over-fertilization, which can be harmful to plants

Boron

Can electrolysed water be mixed with boron and carry it into the vegetation

Electrolyzed water is water that has been treated with an electric current to produce two streams: one with a high concentration of negatively charged ions (such as hydroxide or carbonate) and the other with a high concentration of positively charged ions (such as hydrogen or sodium).

On the other hand, boron is a chemical element that is an essential micronutrient for plants, but excessive amounts of it can be toxic.

While it is possible to mix electrolyzed water with boron, whether it can carry it into vegetation depends on several factors, such as the concentration of boron, the type of vegetation, and the method of application.

However, it is important to note that using electrolyzed water with boron to fertilize plants should be done with caution, as high concentrations of boron can be harmful to plants and humans. It is recommended to consult a specialist or expert before using any chemical treatment for vegetation.

Alkaline Water for Spraying

List of herbicides that mix with high pH alkaline water

The effectiveness of herbicides can be affected by the pH level of the water used to mix them. Generally, most herbicides are designed to be mixed with water that has a neutral pH level (around 7). However, some herbicides can still be effective when mixed with slightly alkaline water (pH above 7).

Here are a few examples of herbicides that can be mixed with slightly alkaline water:

1. Glyphosate: Glyphosate is a broad-spectrum herbicide that is effective against a wide range of weeds. It can be mixed with water that has a pH level between 5 and 8.
2. 2,4-D: 2,4-D is a selective herbicide that is commonly used to control broadleaf weeds. It can be mixed with water that has a pH level between 5 and 8.
3. Triclopyr: Triclopyr is a selective herbicide that is commonly used to control woody plants and vines. It can be mixed with water that has a pH level between 5 and 8.
4. Imazapyr: Imazapyr is a systemic herbicide that is commonly used to control annual and perennial weeds. It can be mixed with water that has a pH level between 6 and 8.

It is important to note that the effectiveness of these herbicides can vary depending on the specific formulation and the pH level of the water used. Always refer to the product label for specific mixing instructions and recommendations. Additionally, it is important to follow all safety precautions when handling and applying herbicides.

We cannot provide an exhaustive list of herbicides that can be mixed with high pH alkaline electrolyzed water, as it would depend on the specific herbicide and the concentration and pH of the electrolyzed water. However, it is important to note that using electrolyzed water as

an herbicide is a relatively new and experimental technique that has not been widely adopted by the agricultural industry.

Before using any herbicide with high pH alkaline electrolyzed water, it is important to consult the herbicide's label or manufacturer for compatibility information and to follow all safety precautions and application guidelines. It is also recommended to consult with an agricultural specialist or extension agent for guidance on the use of electrolyzed water as an herbicide.