

# Eco-friendly and high-performance solutions for Agriculture Applications

**kuraray**

**Kuraray Poval™**

# Eco-friendly and high-performance solutions

## Why polyvinyl alcohol (PVOH) for agriculture applications?

The physical and chemical properties are what make polyvinyl alcohol very versatile and ideal for use in agriculture. It features water-solubility, excellent film forming characteristics, high tensile strength and elasticity, as well as resistance against organic solvents and dispersing power and is inherently biodegradable in water/soil in aqueous solution form.

## Why Kuraray?

Kuraray is committed to product quality, innovation and the ability to provide global solutions to our customers. This means that we produce high-quality, low VOC and low ash-content PVOH with the most narrow and tight product specifications.

We create tailor-made, one-of-a-kind products for our customers and are often sought out to be partners in innovation. Globally, we are offering business continuity and security of supply as well as leverage our local sales, logistics and R&D teams in Europe, Asia and the Americas. Kuraray is committed to developing new fields of business using our pioneering technologies for our PVOH grades that will improve the environment and enhance the quality of life for all.







#### Application 1

## Seed coating

When seeds are coated with polyvinyl alcohol (PVOH), they are protected by a PVOH film, where the water solubility and mechanical strength of the film can be controlled. Polyvinyl alcohol coatings decrease dusting, improve germination and can be applied in a variety of ways.

PVOH is used as a binder for seed coating. Seed coating is the process of applying materials like agrochemical or fertilizer to the natural seed surface. This technology is used for improving physical properties of the seed and the delivery of active ingredients.



Coated seeds





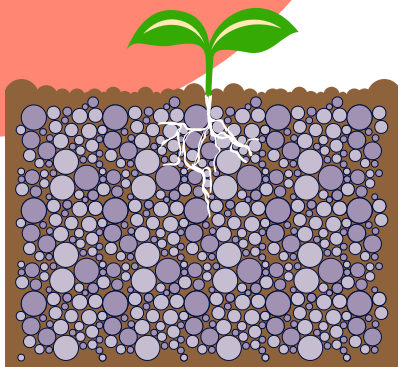


#### Application 2

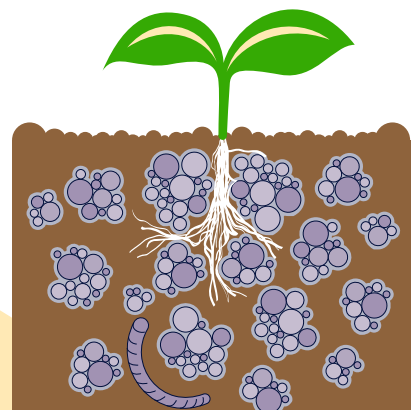
## Soil improver

Polyvinyl alcohol is used for improving soil structure and soil fertility. The polyvinyl alcohol can be either be mixed into the soil or sprayed onto the soil as a solution.

The goal is to create a crumb structure to the soil, like this the roots can penetrate the soil more easily. With a crumb structure some parameters are improved, creating a good environment for soil organisms. These include water retention, drainage and good air permeability.



Bad soil



Good soil  
(Crumb structure)



### Application 3

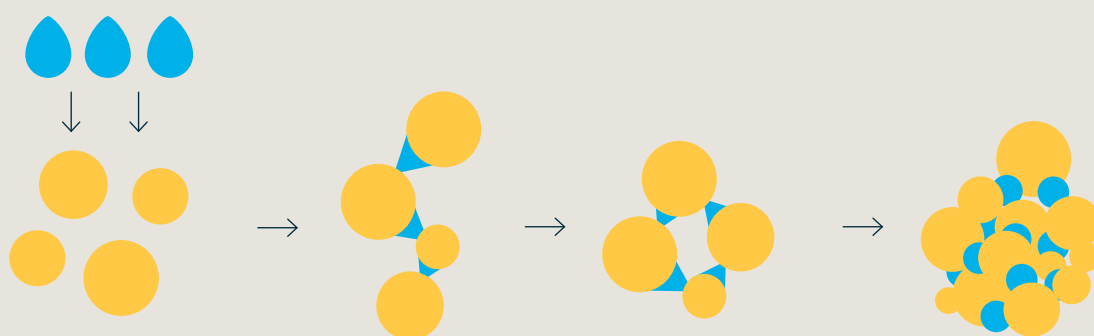
## Fertilizer/ agrochemical binder

Polyvinyl alcohol is commonly used as a binder in fertilizer formulations. It can be applied as a solution or in powder form.

The goal is to accelerate the aggregation of ingredients, and granulation speed, yields and physical properties of the granules (for example release control and water retention properties).



### Fertilizer binder



Binder

Ingredient



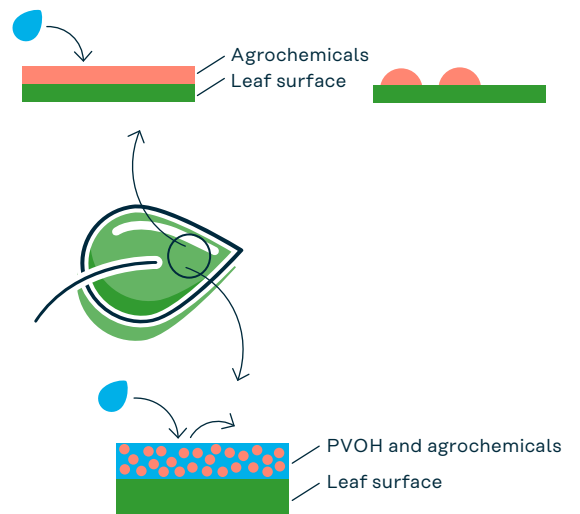


#### Application 4

## Spray adjuvant

In spray adjuvants, polyvinyl alcohol would be one of the key ingredients in the recipes. Polyvinyl alcohol is used for improving rain-fastness which is the ability of agrochemical deposits to resist wash-off by wind and rain.

When using PVOH in spray adjuvants, the effectiveness of the pesticides are significantly improved. PVOH film forming characteristics help to improve the coverage and retention of the pesticides.



## Polyvinyl Alcohol's Unique Characteristics in Agriculture



Inherently biodegradable



Good film formation



Water retention & release control



Rain-fastness



Low-dust off properties



Improved germination

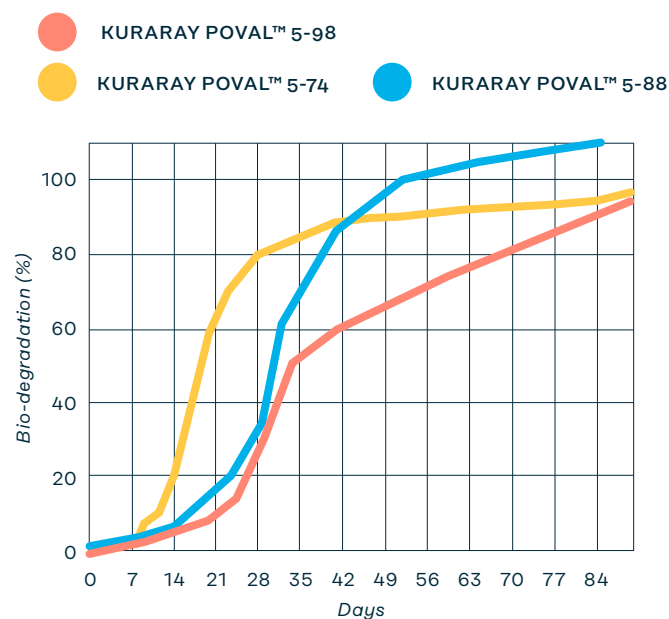


Ease of use

## Biodegradation

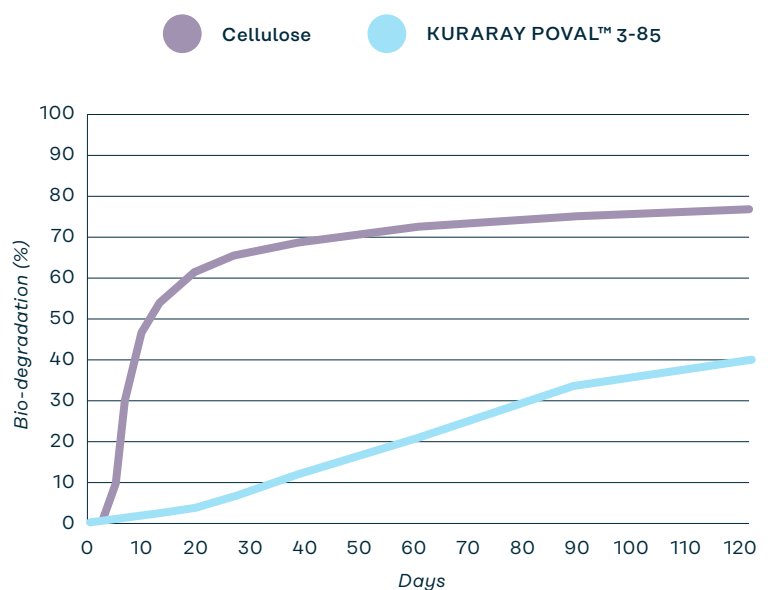
Polyvinyl alcohol (PVOH) is recognized as one of the very few vinyl polymers which are water soluble and inherently biodegradable in water in the presence of micro-organisms. The biodegradability of PVOH is affected by its specification or biodegradation condition.

Fig. 1: Bio-degradation test results for KURARAY POVAL™ with different degree of hydrolysis (ISO 14851)



Kuraray's internal biodegradation in water test result following ISO 14851 is shown in Fig.1. The biodegradation rate of PVOH gets close to 100%. There is a certain induction period until the start of bio-degradation is observed and it is understood that micro-organisms are gradually growing during this period.

Fig. 2: Bio-degradation test results for KURARAY POVAL™ 3-85 (aqueous solution, ISO 17556)



Kuraray's external biodegradation in soil test result following ISO 17556 is shown in Fig. 2. After 122 days, biodegradation of KURARAY POVAL™ 3-85 has proceeded further and an absolute biodegradation of 39.2% was measured. From the test results, we can say that KURARAY POVAL™ is inherently biodegradable when dissolved in water.

# Adding value to your products – worldwide

KURARAY POVAL™, EXCEVAL™, ELVANOL™, and MOWIFLEX™ are the trademarks for polyvinyl alcohols (PVOH) made by Kuraray. Their key characteristics — outstanding film-forming properties and high binding strength — add real value to your products. Our polymers are water-soluble, highly reactive, crosslinkable and foamable. They have high pigment binding capacity, protective colloid characteristics and thickening effects. The physical and chemical properties of KURARAY POVAL™ make it ideal for a wide variety of applications, ranging from adhesives through paper and ceramics to packaging films. Many of our polymers are food contact-approved and thus suitable for food applications.

Kuraray produces its wide range of KURARAY POVAL™ grades in Japan, Singapore, Germany and the USA. Kuraray's global production and service network make us your partner of choice for innovative high-quality PVOH resins.



**Kuraray Poval™**

PLEASE CONTACT US  
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