

BINDER



UREA

CHOOSING A FERTILIZER THAT GETS THE JOB DONE

Your plants need nitrogen to grow. You need a fertilizer solution. So why choose Arborite®AG?

Field trials and lab studies show significant loss of nitrogen is likely when using urea fertilizers in broadcast applications on the soil surface. This is particularly true where there is crop residue or grass sod covering the soil.

Arborite® products are a family of technologies and products originally developed for growing trees. Arborite®AG is a urease inhibitor product that helps reduce loss of urea N as ammonia until rainfall or irrigation water can move urea into the soil.

BENEFITS

- Can help retain more nitrogen in the soil for longer periods.
- Can help improve economic yield and lower nitrogen costs.
- Can be used with many crops or soils where volatilization is a factor.
- Provides no-till farmers with greater flexibility for nitrogen management.
- May improve cost-efficiency when used with tillage systems that require surface-applied nitrogen.
- Can be added to UAN solution as a tank mix or coated onto solid urea.

ARBORITE®

FERTILIZER TECHNOLOGY BY WEYERHAEUSER

FOR MORE INFORMATION

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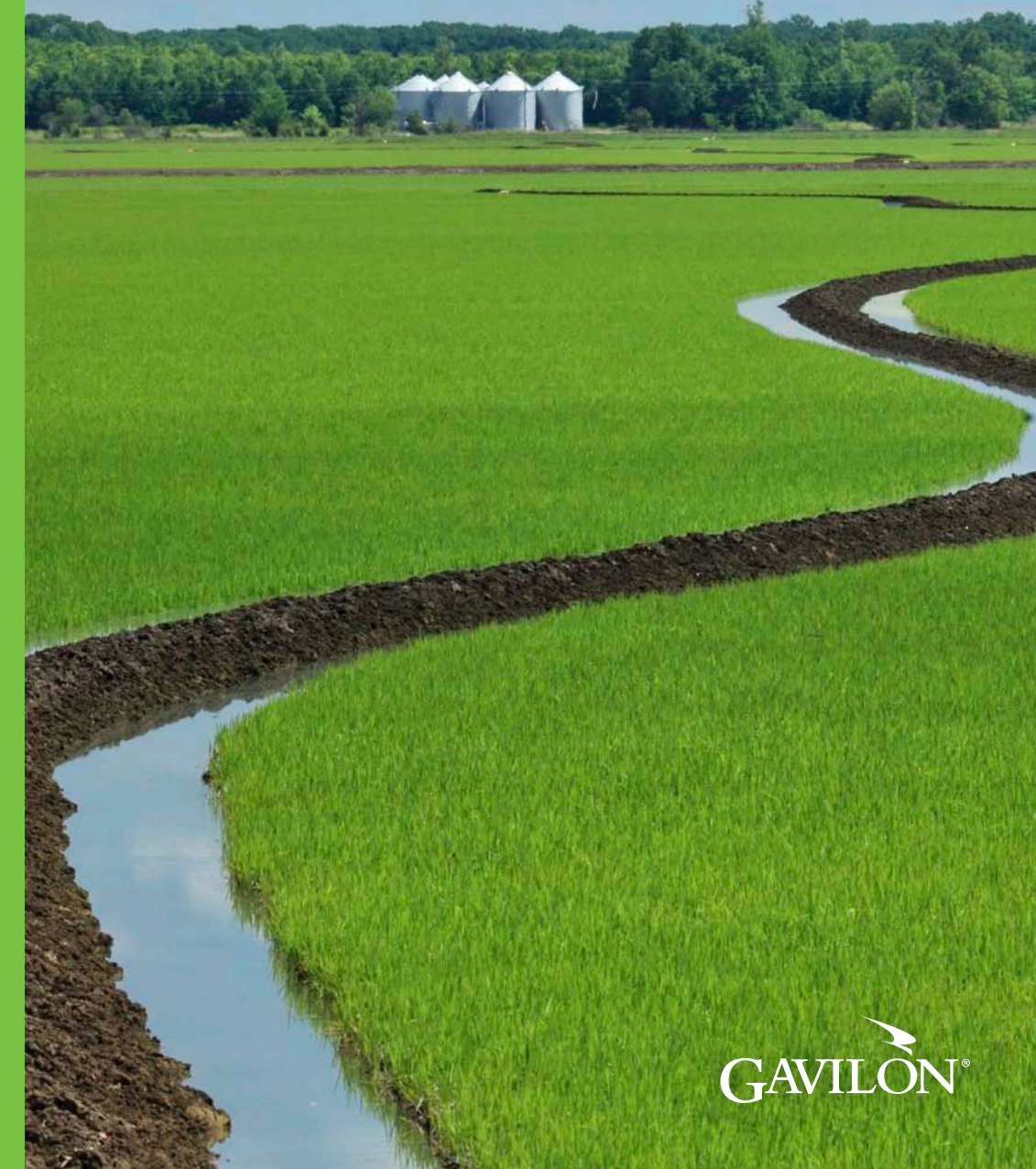
* Studies evaluating equipment and procedures are being conducted by University researcher(s) to develop a standard volatility measurement system.

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ARBORITE®

FERTILIZER TECHNOLOGY

BY WEYERHAEUSER



GAVILON®

FERTILIZER TECHNOLOGY

BY WEYERHAEUSER

Controlling nitrogen loss so your plants get more, the environment gets less, and you get the most out of your fertilizer investment.

WHAT IS ARBORITE® AG?

Arborite® AG is the newest member of the Arborite family of products. Arborite® AG uses Weyerhaeuser's unique liquid formulation with NBPT to either coat urea granules or mix with urea nitrate solutions (UAN). This helps control volatility until rain or irrigation can occur.

Originally developed for intensively managed southern pine plantations, this technology has been modified for use in agriculture. The original forestry product has been used on more than two million acres of forestland since 1998.

WHY IS NITROGEN IMPORTANT?

Nitrogen is essential for plant growth. In fact, it's considered the greatest limiting factor for growth in most plants, which means that without sufficient nitrogen, your crops will not reach their full potential. Unfortunately, all kinds of factors can affect the quantity of nitrogen available. That's where Arborite® AG comes in.

The NBPT in Arborite® AG—treated fertilizer inhibits the interaction between urea and urease in the soil, which helps slow the conversion of urea to ammonia and carbon dioxide. By reducing this volatility, more nitrogen can remain in the soil for a longer period of time.

WHY DO I HAVE TO WORRY ABOUT NITROGEN LOSS?

The more nitrogen you make available to your plants, the better they will grow, so it makes sense to fertilize your crops in a way that minimizes nitrogen loss.

Figure 1 shows what happens to most urea-based fertilizers after they are applied. Micro-organisms in the soil produce an enzyme called urease, which interacts with urea to release nitrogen as ammonia gas. The loss of nitrogen from urea in the form of ammonia is referred to as volatilization.

This breakdown of urea begins as soon as it is applied to the soil. Volatilization rates are affected by many factors¹ including rate of fertilizer application and placement, ground cover and residue, soil and atmospheric temperature, soil moisture content, relative humidity, soil pH, soil buffering capacity and soil cation exchange capacity.²

Generally, the rate of nitrogen volatilization from urea-based fertilizers is greatest just after application, with the majority occurring within two to four days or even faster on high pH soils.

HOW DOES WEYERHAEUSER'S TECHNOLOGY HELP REDUCE VOLATILITY?

Weyerhaeuser's unique patented system dissolves NBPT (otherwise known as N-(n-butyl) thiophosphoric triamide) into solution to coat urea granules or mix with urea based solutions. NBPT was identified as a urease inhibitor in the 1980s⁴ and some studies show it has been one of the most effective inhibitors available in the last 25 years^{5, 6, 7, 8}.

Figure 2 shows the results of a laboratory study that measured the nitrogen volatilization of untreated urea and Arborite® AG treated urea when used on agricultural soil⁹. The graph demonstrates that

Arborite® AG—coated urea with NBPT reduced nitrogen volatilization from 67% to only 10% in this laboratory test under these conditions.⁹

Figure 3 shows the results of a 2011 corn field trial at Louisiana State University. This study shows the potential impact of reducing nitrogen volatility for improved crop yields by using urea coated with Arborite® AG.

Field studies that incorporate NBPT with urea have been performed with success on a variety of crops, such as corn, wheat, cotton, forage, and barley^{10, 11}.

ARE THERE OTHER WAYS TO PREVENT NITROGEN LOSS?

There are other fertilizer options, and while each has some impact, the loss of nitrogen may still be significant and costly

- Anhydrous ammonia (82-0-0) requires special equipment and more horsepower to incorporate the gas from under the soil surface to prevent the escape of ammonia gas.
- Ammonium nitrate (33-0-0) is used for pastures and hay production but is expensive. Its potential for use in explosives has increased the cost of handling and reduced availability.
- Urea Ammonium Nitrate (UAN) is generally higher in cost per unit of nitrogen and requires special equipment to incorporate into the soil properly. There is also volatility potential when using UAN because one half of the nitrogen in UAN comes from urea.

WHY CHOOSE ARBORITE® AG?

Arborite® AG is easy to use and does not require special equipment. It can be applied to granular urea, or mixed with UAN, which are the most readily available, and generally the most cost efficient, sources of Nitrogen. Arborite® AG helps keep nitrogen in the soil by decreasing potential loss from volatility. Improved nitrogen availability helps maximize potential growth and yields from your nitrogen investment.



ARBORITE® AG is made with Weyerhaeuser technology to improve nitrogen retention with a proven volatility inhibitor. Put more nitrogen into your plants, and less into the environment.



Figure 1
Fertilizer Nitrogen Cycle

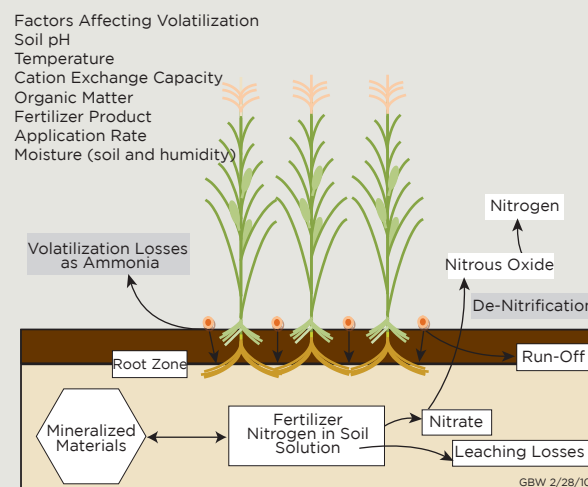


Figure 2
Cumulative Nitrogen Losses in lbs N per Acre for Arborite® AG

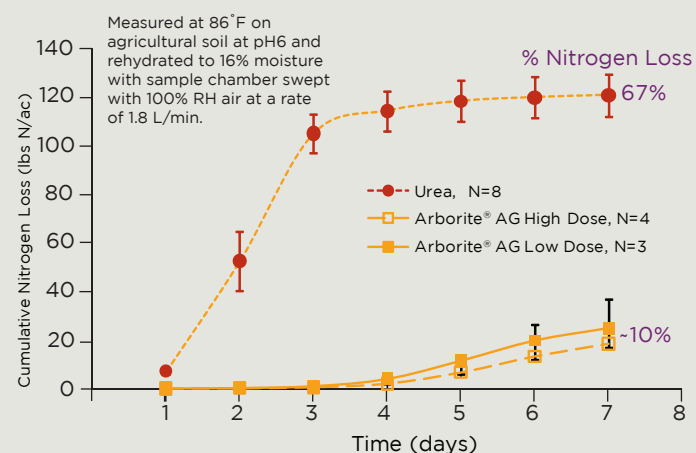


Figure 3
2011 Corn Yield Comparison Using Urea and Arborite® AG Treated Urea

