

Technical Bulletin

Gradual-N™ 21-0-0-2B

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Introduction

Gradual-N™ 21-0-0-2B is comprised of slowly available nitrogen in combination with complexed boron. Approximately 60% of the nitrogen (12.6% total) is in the slowly available form and 40% (8.4% total) is in the urea form. It has an alkaline pH. Therefore, when alkaline hydrolysis is a concern with certain pesticide combinations, a buffer may need to be used.

The synergistic effects of applying boron and nitrogen have been well documented in the professional literature. However, one problem that exists is that, many times, the “shock” of an application of totally available nitrogen may cause some fruit abortion. Fruit abortion is normally caused by plant stress. In this case, the stress is caused by having more nitrogen available than the plant can utilize. Simply, the plant produces high amounts of auxins which are translocated to the fruit. This level is such that an imbalance occurs causing the abscission layer to form which results in flower or fruit abortion.

Adequate plant concentrations of boron are necessary for proper nitrogen metabolism, fruiting, and pollination. These are very important in enabling the plant to transport sugars across cell walls. This sugar transport is important during photosynthetic activity, but is extremely important during respiration (dark reaction) for the plant to be able to utilize the energy produced during the day.

Gradual-N™ 21-0-0-2B has 40% of the nitrogen available immediately, but 60% of the nitrogen is available to the plant over time. The release of boron to an available



form is governed primarily by temperature. However, most of the nitrogen, under field conditions, will be released to the plant within 21 days after application.

Gradual-N™ 21-0-0-2B allows you to apply higher rates of nitrogen since all of the nitrogen is NOT available upon application.

Crops Labeled

Berries: strawberry

Grain and Other crops: corn, canola, cereals, cotton, rice, sugar cane

Vegetables: carrot, cole crops, cucurbits, lettuce, onion, pepper, potato, and tomato

Tree and Fruit Crops: apple, citrus, pear, apricot, cherry, nectarine, peach, and vines

Turf: northern and southern grasses.

Use Rates and Timing

Gradual-N™ 21-0-0-2B is most often recommended at 2 to 8 quarts per acre.



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Contents

Total Nitrogen	21.0%
8.4% urea N	
12.6% slowly available N	
Boron (B).....	2.0%
Arsenic (As).....	< 5 ppm
Cadmium (Cd).....	< 5 ppm
Lead (Pb).....	< 5 ppm
Derived from urea, methylene urea, and boric acid.	

Technical Specifications

Product class	fertilizer
Formulation	liquid
Weight/ gallon	10.4 pounds
Specific gravity	1.25
pH	8.8-9.2
Solubility in water	miscible
Appearance	clear to light yellow
Odor	none
Min. storage temp.	32°F
Container size	
bulk	
270 gallon mini-bulks	
2 x 2.5 gallon package	
30 and 55 gallon drums available	

This bulletin provides some technical information and is not intended to give complete information for all applications. Always read and follow label directions.

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