



Information Sheet

4.8 Registered chemicals for cane quality management: ETHEPHON (and other trade names)

This Information Sheet provides important information and recommendations for the correct and optimal use of 2-chloroethyl phosphonic acid (ETHEPHON and other trade names, hereinafter referred to as "this chemical") for cane quality management in sugarcane.

Chemical information and mode of action

This chemical is a soluble concentrate that contains 480 g of 2-chloroethyl phosphonic acid (the active ingredient) per litre of formulation. It is a Group III substance (slightly hazardous) that is relatively safe to use. However, it is a plant growth regulator and should be confined to the target crop.

This chemical has proven to be effective for improving cane quality (chemical ripening) in South Africa and Swaziland when it is applied to very immature, vigorously growing sugarcane due for harvesting from March to July. After uptake by the leaves, the active ingredient rapidly releases the plant hormone ethylene. Ethylene results in a reduction (up to 50%) in the size of leaves produced after application.

The shortening of the newly formed leaves often gives a fan-like appearance to the canopy. The chemical suppression of leaf growth increases sucrose storage in the stalk (i.e. ripening) through lowering of sucrose consumption by this growth process. In cane not suffering from drought stress, any effect on stalk growth is short-lived as indicated by the shortening of only one or sometimes two successive internodes. Side shoots may develop and lower leaves may become chlorotic (yellow).



Long-term effect of this chemical and main mode of action – shortened leaf blades. ▲



▲ **Short-lived effects of this chemical on stalk elongation as seen by the shortening of only one internode.**

Recommendations

Which crops will respond to this chemical?

This chemical should be applied only to immature vigorously growing irrigated or rainfed sugarcane with a whole-stalk juice purity of less than 75% at the time of spraying. It is essential to test for juice purity levels before deciding to spray this chemical.

When applied to more mature crops, with juice purities higher than 75%, this chemical can cause reverse responses (i.e. reduction in cane maturity). Hence, this chemical is not suitable for ripening of carry-over crops (unless juice purity testing indicates otherwise) or for late-season quality maintenance when the cane will be very mature at spraying. This chemical should not be applied to sugarcane suffering from drought stress or any other yield-limiting factor, in particular eldana, of which the infestation can become more severe.

Guidelines for identifying suitable cane for ripening with this chemical are provided in Information Sheet 4.6.

Juice purity can be determined in a laboratory from stalk samples collected from the target field not more than 1 - 2 weeks before spraying. Sixteen randomly selected stalks (of uniform length), collected from several positions within the field, must be stripped of all leaves, topped at the natural breaking point, and bundled together into a single sample. These samples should be submitted to the Cane Testing Service (CTS) at the mill or submitted to your local Extension Specialist, who will make arrangements for testing at the SASRI millrooms (Pongola or Mount Edgecombe).

Alternatively, a quick method is to determine Brix% along the length of stalks collected from the target field with a hand-held refractometer and to use these values to estimate juice purity with the smartphone application **PurEst**[®]. Refer to SASRI Information Sheet 4.7 that explains how to estimate whole-stalk juice purity on the farm with **PurEst**[®].

Will all varieties respond to this chemical?

No. Responses from some varieties have been inconsistent and small, and this chemical is not recommended for these varieties (see Variety Information Sheets and new online variety guide for details or the latest variety response table in **PurEst**[®]).

Rates and timing of applying this chemical as an individual or combination treatment

This chemical should be applied at 1.5 litres per hectare. Spraying should be planned according to the schedules below, which are based on a monthly harvesting programme. A convenient spray date guide calculator has also been incorporated within the **PurEst**[®] application. Generally, when crop growth rates are highest, a spray- to-harvest interval of 8 weeks will be sufficient. However, when growth rates are slower, such as in the majority of rainfed crops, and irrigated crops during winter, the general recommendation is a spray-to-harvest interval of up to 12 weeks.

Individual treatment

Responses to this chemical hold for at least four weeks when growth is vigorous, so a grower has the option of spraying a number of fields on one day and harvesting these fields over a period of weeks. Alternatively, a grower could spray individual fields over a period of weeks and then harvest those fields all at the same time, provided the spray-to-harvest interval is between 8 and 12 weeks. For example, during the first week of February all fields that are scheduled for harvesting during April can be sprayed with this chemical.

Combination treatment

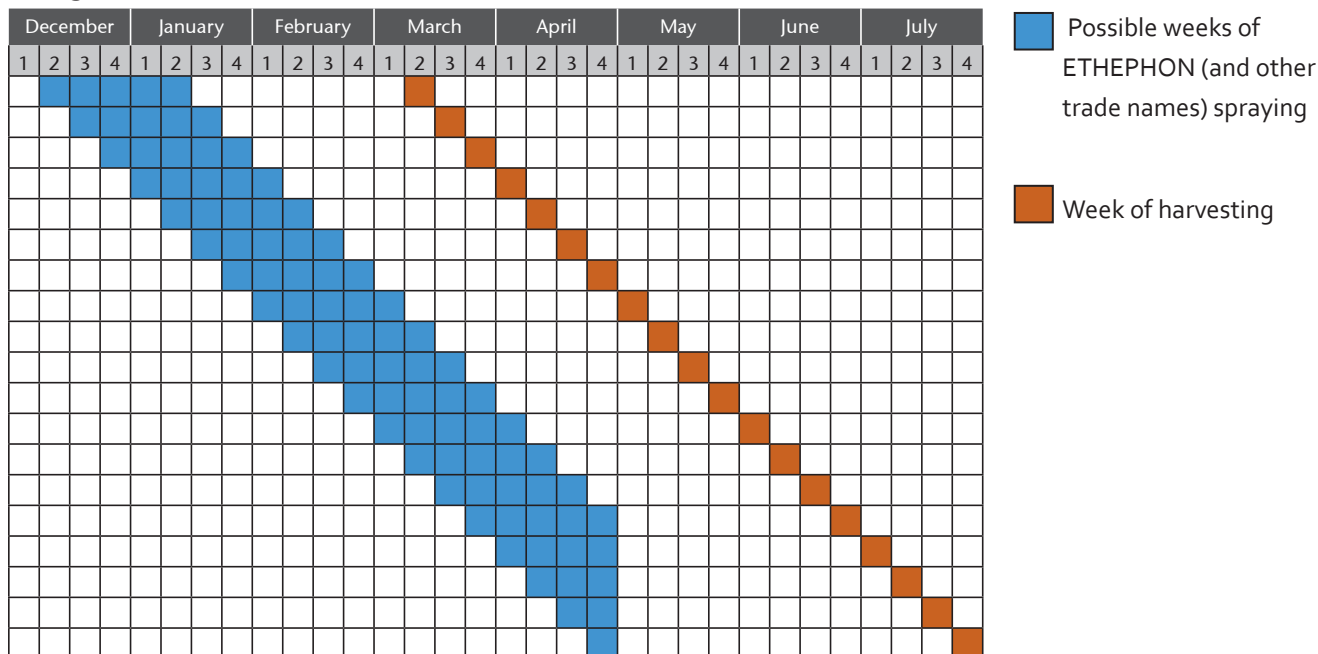
In this treatment, the application of this chemical is fixed at 12 weeks before harvesting followed by application of FUSILADE FORTE (and other trade names) five to six weeks later to the same crop. In certain varieties, this combination treatment produces much better RV yields than obtained from either chemical applied alone (see Variety Information Sheets and new online variety guide for details or the latest variety response table in **PurEst**[®]).

When considering the combination treatment, it is important to note that whole-stalk juice purity at the time of applying this chemical should be below 75%. If the juice purity is above 75%, this chemical should not be applied. Instead, FUSILADE FORTE (and other trade names) or MODDUS (and other trade names) should then be considered and applied according to the recommendations supplied in Information Sheets 4.9 and 4.10.

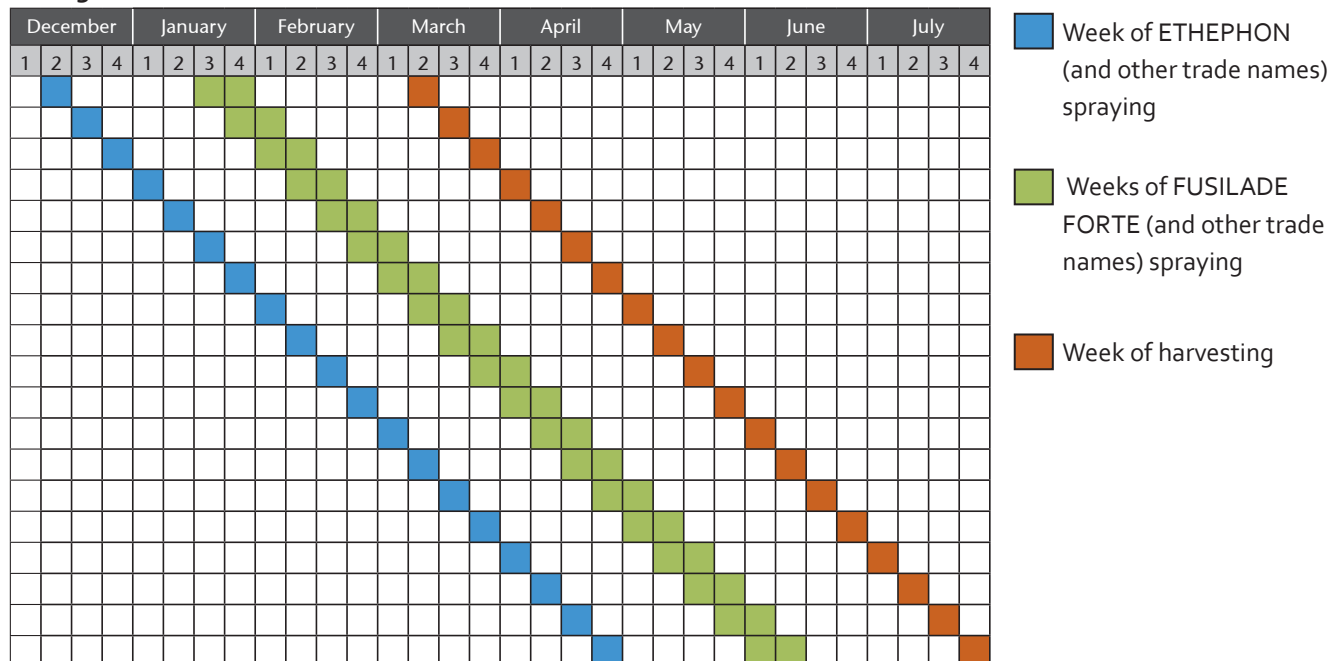
Does this chemical affect the following crop?

No, it has no adverse effects on the following ratoon.

Timing of individual treatment



Timing of combination treatment



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