



Information Sheet

12. RIPENERS

12.3 Registered chemicals for ripening sugarcane: ETHEPHON

This Information Sheet provides important information and recommendations for the correct and optimal use of 2-chloroethyl phosphonic acid (ETHEPHON) as a sugarcane ripener.

Product information and mode of action

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

ETHEPHON has proven to be a highly effective chemical ripener in South Africa and Swaziland when it is applied to immature, vigorously growing sugarcane due for harvest 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. Any reduction in stalk growth is short-lived as indicated by the shortening of one or sometimes two successive internodes. Side shoots may develop and lower leaves may become chlorotic (yellow).



Long-term effect of ETHEPHON and main mode of action – shortened leaf blades.



Short-lived effects of ETHEPHON on stalk elongation as seen by the shortening of only one internode.

Recommendations

Which crops will respond to ETHEPHON?

ETHEPHON 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. When applied to more-mature crops, with juice purities higher than 75%, ETHEPHON can sometimes cause reverse responses (i.e. reduction in cane quality). ETHEPHON should not be applied to sugarcane suffering from drought stress or any other yield-limiting factor. Guidelines for identifying suitable cane for chemical ripening are to be found in Information Sheet 12.1.

Juice purity can be determined in a laboratory from stalk samples collected from the target field a week or less before spraying. Sixteen randomly selected stalks (of uniform length), collected from a number of 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 from the target field with a hand-held refractometer and to use these values to estimate juice purity with the smartphone app **PurEst™**. Refer to SASRI Information Sheet 12.2 that explains how to estimate whole-stalk juice purity on the farm with **PurEst™**.

Will all varieties respond to Ethephon?

No. Responses from some varieties have been inconsistent and small, and ETHEPHON is not recommended for these varieties (see Variety Information Sheets for details).

Rates and timing of ETHEPHON application as an individual or combination treatment

ETHEPHON should be applied at 1.5 litres per hectare. Spraying should be planned according to the schedules below, which is based on a monthly harvesting programme. Generally, when the crop is growing rapidly, a spray-to-harvest interval of 8 weeks will be sufficient. When growth is slower, as in June and July, a long interval of up to 12 weeks may be necessary.

Individual treatment

Responses to ETHEPHON 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 ETHEPHON.

Combination treatment

In this treatment ETHEPHON application is fixed at 12 weeks before harvesting followed by application of FUSILADE FORTE (and generics) five to six weeks later to the same crop. In certain varieties this combination treatment produces much better RV yields than obtained from either ripener applied alone (see Variety Information Sheets for details).

When considering the combination treatment, it is important to note that whole-stalk juice purity at the time of ETHEPHON application should be below 75%. If the juice purity is above 75%, ETHEPHON should not be applied. Instead, FUSILADE FORTE (and generics) or MODDUS should then be considered and applied according to the recommendations supplied in Information Sheets 12.4 and 12.5.

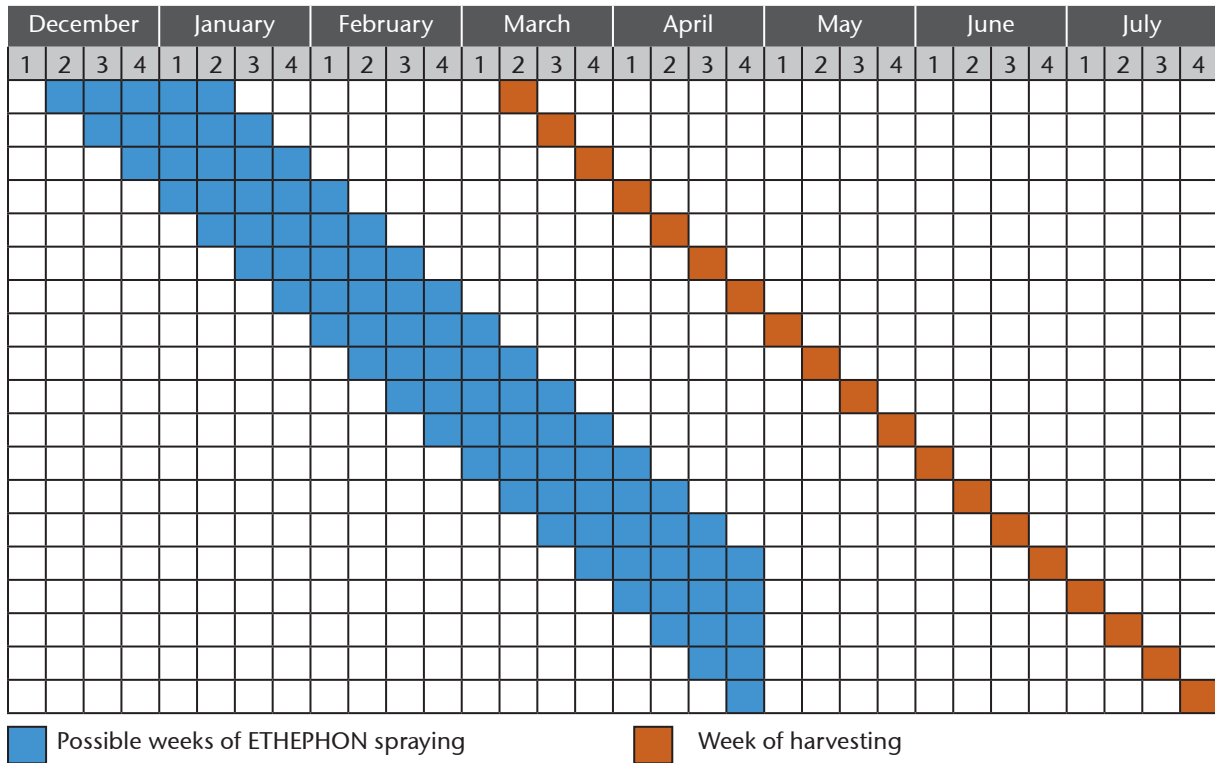
Does ETHEPHON affect the following crop?

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

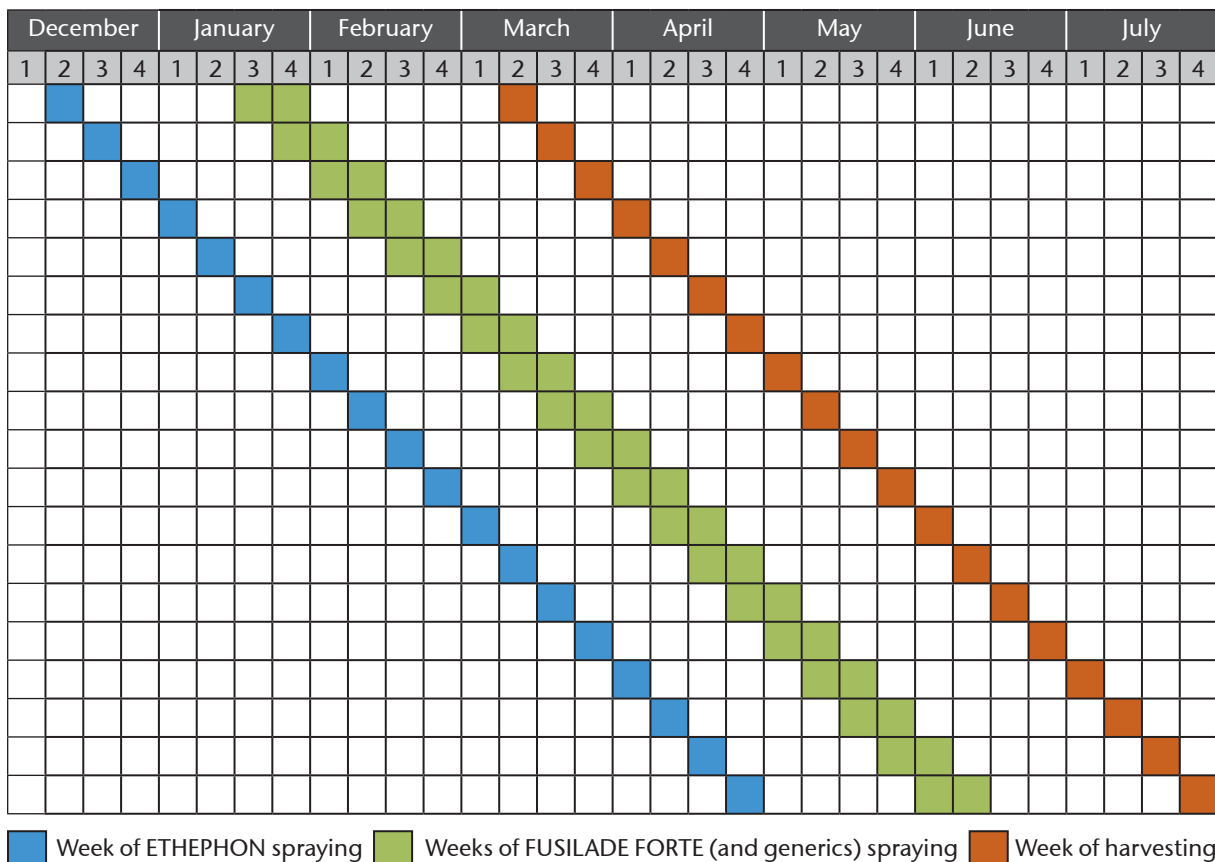
Can cane which has been sprayed with Ethephon be used for seedcane?

No. Chemically-ripened cane should never be used for seedcane.

Timing of ETHEPHON application (individual treatment)



Timing of combination treatment



Updated by Riekert van Heerden (SASRI Senior Scientist: Sugarcane Physiology)
March 2017