

# **METHYL BROMIDE - AN APPLICATION SEEKING AN EXEMPTION FROM THE 2020 METHYL BROMIDE FUMIGATION REGULATIONS FOR IMPORTED FRESH PRODUCE**

**Applicant:** New Zealand Fresh Produce Importers Association

**Date:** 29 August 2019

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## **Introduction**

The New Zealand Fresh Produce Association (NZ FPIA) represents companies that are responsible for the importation of approximately 98% of all fresh fruits and vegetables by volume and value and has been supporting the fresh produce industry in an independent capacity for more than 17 years. Amongst other things, the NZ FPIA members aim to provide New Zealand consumers with a wide range of healthy, safe and year-round supply of quality fresh produce.

NZ FPIA wishes to make a submission on the impacts of the proposed change in Methyl Bromide (MB) Fumigation Regulations will have on the importation and related retailer/consumer aspects of the New Zealand fresh produce industry. The fresh produce industry is a small user of MB, comprising under 0.5% of MB usage. However, the impact of the proposed change to New Zealand consumers and the imported and domestic fresh produce industry is potentially very significant.

NZ FPIA is seeking an exemption from the 2020 Methyl Bromide Fumigation Regulations for imported fresh produce.

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## **Background**

In 2010, the Environmental Protection Authority (EPA) issued proposed changes to regulations that methyl bromides continued use in New Zealand as a fumigant must be undertaken using recapture technology such that only 5ppm of MB exists in the headspace prior to venting. Further, the users of MB would discontinue use of MB if suitable alternatives are available.

New Zealand Researchers have spent in excess of \$30million to find suitable recapture technology for MB. To date, this has provided no suitable or commercially viable solution.

At the time of this application, no suitable treatments are available to replace all the functions that MB presently performs across all sectors. Nor is it likely that there will be a cost-efficient recapture

technology that is able to reduce concentrations of MB in the headspace post fumigation to 5ppm, by October 2020.

### **Methyl Bromide use in New Zealand**

MB is an important on-arrival contingency option for a number of country/crop lines of fresh produce currently imported into New Zealand. MB is currently used as a quarantine treatment to treat a range of imported fresh produce when consignments are detected to have above allowable tolerance levels of live regulated pests or there is uncertainty around the identification of an intercepted pest.

Quarantine treatment of imported fresh produce is usually directed as one of three main options to importers by the Ministry for Primary Industries (MPI) to ensure that identified consignments do not pose a biosecurity risk to New Zealand. The other two options are reshipment or destruction of consignments.

There has been a significant increase in the use of MB since the EPA reassessment of the HSNO Act approval in 2010. Annual consumption of methyl bromide has increased from ~400 tonnes in 2010 to ~600 tonnes in 2016. Fumigation of forest products for export accounts for around 95% of the MB use in New Zealand. New Zealand has a significant and growing industry exporting logs and other forest products, and the industry relies on MB to meet the phytosanitary (free of quarantine pest) requirements of the importing countries.

There is a small but very important use of MB in the fresh produce sector (imports and exports). Consequently, the amount of MB used as quarantine treatment for imported fresh produce is very small, relative to other users – historically less than 0.5% of New Zealand's total MB use has been used as a quarantine treatment of imported fresh produce. The use patterns and annual MB usage has remained static and in sync with historical norms. While MPI has a number of alternative approved treatments that can be used, their effect on quality of many imported fresh produce consignments is either untested, or when applied, the produce quality has deteriorated to a level where it is not fit for sale and/or human consumption.

For imported fresh produce, any interruption of the cold chain and other supply chain activities for the periods required to recapture MB to 5ppm will have a significant effect on the quality of the fumigated product. Adding extra time to apply treatments to perishable products to meet new emission requirements would not be feasible in many cases (i.e. the product quality deteriorates very quickly under normal MB fumigation [combined with heat] parameters let alone longer exposure times). This means that a recapture fumigation model would not be commercially viable in most cases.

Any disruption to historically accepted treatment options for imported fresh produce could result in significant and wide-spread disruption to supplies of out-of-season produce and/or commodities that are not grown in New Zealand. This would result in significant trade and economic impacts for many supply countries. In particular, many Pacific Island countries would either not be able to trade some important commodities or there would be significant impacts on their ability to trade.

## **Research**

Industry acknowledges that MB is an ozone depleting substance and like all fumigants at high levels, can be toxic to humans. Industry is committed to on-going research into better recapture and the registration of alternatives. This includes proactive research into new and innovative pre-export risk management options to reduce the need for MB usage. However, under our international obligations, MB use for QPS treatments is exempt from the provisions of the Montreal Protocol, as the Protocol does not require that MB be banned, but rather, that suitable alternatives be used when they become available. [Refer: Montreal Protocol].

Industry has looked internationally for solutions and considered a wide range of approaches but has not provided solutions which will reliably allow the control of 5ppm of MB in head space at the completion of fumigation. No alternatives are yet available to replace all of the functions that MB currently provides, and there is no cost-efficient technological solution capable of achieving recapture sufficient to achieve residual levels of MB less than 5ppm.

The use of irradiation is technically possible and provides for a “generic” treatment approach similar to the broad spectrum control options MB offers for a range of pests. While technically possible, and in place as an agreed pre-export treatment for some country/commodity/pest combinations, there are no commercially available irradiation treatment facilities available in New Zealand at this time.

### Methyl bromide recapture performance

There is very little published data on the performance of MB recapture systems (TEAP 2006). TEAP estimates that there is scope for avoiding about 70% of current emissions derived from quarantine and pre-shipment (QPS) use (about 8,500 tonnes of global MB use) if recapture or destruction technologies were used (TEAP 2019).

Industry is not aware of any published information to confirm that the current recapture units available in New Zealand are able to achieve the required 5ppm workplace exposure level (WES) considering the various sorption/desorption rates of various goods and packaging of goods.

Anecdotal evidence suggests that the current recapture technology cannot achieve the Workplace Exposure Standard (WES) level of 5ppm for MB unless run for a significant period of time (Sama et al. 1995). When the recapture unit is removed the desorption of the gas from fresh produce occurs continuously over a 24 hour to 12-day period and often exceeds 5ppm.

According to Genera Ltd, the largest provider of recapture services in New Zealand, it is not possible to achieve 5ppm of MB with many commodities. As an example, the MB fumigant in large log stacks can be reduced down from 80g/m<sup>3</sup> administered, to around 10g/m<sup>3</sup> (2,570 ppm) remaining after eight hours recapture.

Using current MB fumigation processes, immediately after treatment, fresh produce typically has a MB level of 400-800ppm, dependent on the crop and packaging, which will therefore require additional time to reduce MB to 5ppm levels.

International research on MB recapture from fresh produce fumigations has determined that the 5ppm levels requires up to 12 days of off-gassing post fumigation before falling below the 5ppm level that will be required. This 12-day period is impractical from a perishability standpoint for fresh produce, as many highly perishable crops will deteriorate and become unsalable within this timeframe.

The common practice within the industry is for any product treated with MB to be sold as soon as possible, because it will deteriorate more rapidly due to the break in cool-chain management required for fumigation, coupled with the MB treatment also causing product deterioration. A timeframe of up to 12 days for recapture will also have an unacceptable effect on costs and logistics.

Further research has indicated that carbon-based recapture systems have the potential to recapture up to 98% of the fumigant. However, currently available commercially viable systems being developed in New Zealand are only able to capture up to 80% of fumigant off-gases from log stacks fumigated with MB. At 80% commercially viable recapture level, MB concentrations of fresh produce are therefore likely to be over 80-100ppm with current fumigation timeframes.

The deadline set in 2010 to have recapture technologies available for use with all MB fumigations within 10 years was a goal that has served New Zealand well as a strong driver of innovation; but it has become clear that it is impossible to achieve nor is it possible to implement commercially viable systems in practice.

## Methyl Bromide Fumigations of Imported Fresh Produce 2018

Based on data supplied by NZ FPIA members and MPI, there were 16,359 consignments of fresh produce imported in 2018. Of these, 2061 consignments were fumigated with MB.

Table 1 – 2018 MB Fumigations of Fresh Produce

Produce / Produce type	Total MB Fumigations	% of Fumigations
Citrus	323	16%
Pacific Root Crops	266	13%
Pacific Leaf Crops	227	11%
Other vegetables	193	9%
Melons	144	7%
Coconut	100	5%
Peas	91	4%
Capsicum	85	4%
Stone fruit	76	4%
Pineapple	75	4%
Tropical fruit	70	3%
Grapes	60	3%
Okra	52	3%
Other fruit	52	3%
Zucchini	51	2%
Pipfruit	41	2%
Bananas/Plantain	36	2%
Beans	31	2%
Kiwifruit	28	1%
Cucurbits	23	1%
Basil	15	1%
Sugarcane	9	<1%
Chillies	7	<1%
Lemon Grass	4	<1%
Tomato	3	<1%
Kava	2	<1%
<b>Total Fumigations</b>	<b>2061</b>	<b>100%</b>

Source MPI

Table 2 – Summary of 2018 Treatments of Imported Fresh Produce

Country of Origin	Total consignments imported	Consignments treated	Percent treated
Pacific Islands	4741	1824	38%
Australia	3708	1124	30%
United States	2102	955	45%
Chile	119	41	34%
Other countries	5789	4757	84%
<b>Total</b>	<b>16359</b>	<b>8701</b>	<b>53%</b>

Source MPI

Note: Table 2 includes all phytosanitary treatments undertaken at the border. Treatments include fumigation with MB and hydrogen cyanide, cold disinfestation, heat treatment, freezing, or reconditioning (cleaning, grading and repacking, sorting etc).

MPI's import health standards require that exporting countries, where required, have systems in place and/or take risk mitigation measures (approved by MPI) before certain commodities can be exported to New Zealand. On arrival at the border, should live regulated pests be detected, the importer may be directed to have the consignment: a) treated (and MB is one of the approved treatments), or b) re-shipped, or c) destroyed, to ensure the produce no longer poses a biosecurity risk to New Zealand.

According to historical norms, around 30-35% of imported fresh produce consignments arriving in New Zealand have pest infestations exceeding the regulated allowable tolerance or the intercepted pest cannot be identified thus defaulting to being categorised as a 'regulated' pest as a precautionary measure. Fresh produce consignments (except bananas) that arrive at the New Zealand border with live regulated (or unidentifiable) pests that are directed for treatment are most often treated with MB. Using MB fumigation allows a rapid treatment and release of the product to market.

#### Australian Fruit and Vegetable Crops

Australian vegetables are especially important and significant for New Zealand consumers in winter (May-October). These include citrus, pears, grapes, green beans, zucchini, cucumber, capsicum, tomatoes, fresh corn, strawberries and melons which are part of staple diets. These crops have a significant impact from a retail and consumer perspective.

## Citrus

Most of the imported citrus is from USA and Australia. These imports are an important staple produce and provide year-round availability for the New Zealand consumers. There are pre-shipment and in-transit treatments available for citrus from the USA and pest free areas of production requirements from Australia to control unwanted pests in consignments. However, around 15 - 20% of citrus imports (which also includes small volumes from countries other than Australia and USA, including Pacific Island countries) have been historically required MB fumigation on arrival.

## Grapes

Grape are imported from Australia, Chile and USA. Most consignments are subject to pre-shipment inspection arrangements, however, around 3-6% of all grape consignments are treated with MB on arrival in New Zealand.

## Pacific Island Crops

Pacific Island crops are a significant staple food for many of New Zealand's Pacific Island community. A wide range of crops are imported, with those of most significance are root crops (e.g. taro), eggplants, papaya, various leaves of plants and coconuts. Significant volumes of other crops such as turmeric, ginger, beans and fresh herbs are also imported.

The importance of the Pacific Island crops to enter the New Zealand market not only provides staple foods for the local Pacific Island community, but it also provides sustainable and ongoing development opportunities for commercial agriculture production in the Pacific. This has significant flow-on economic benefits to Pacific Island growers and their communities.

Fumigation with MB on arrival is an important contingency option for many commodities from the Pacific. For Pacific root and leaf crops, the frequency of MB use (albeit at very low volumes) is reasonably high. For example, on-arrival MB fumigation of taro consignments can be 90%+ at certain times.

## **Economic Benefits-of Imported Fresh Produce**

The imported fresh produce industry is worth over \$385 million (duty value). This equates to around \$800 million of retail sales. The increase in variety and year-round availability of imported fresh produce trade has benefited New Zealanders since consumer preferences are much more closely matched with year-round import supply.

Imported product such as bananas, grapes and oranges are significant year-round staple foods in the New Zealand diet. Other imported produce lines (e.g. tomatoes, beans, capsicums and courgettes) are significant in winter months supplementing New Zealand's low winter production volumes. Pacific Island root crops and vegetables are culturally significant to the Pacific Island communities in New Zealand and result in significant economic returns to the various export supply countries around the Pacific. New Zealand consumers also value the year-round availability of tropical fruits such as pineapples, papaya, mangoes and the seasonable availability of other imported niche products such as strawberries, litchis, asparagus, cherries, snow peas and other produce.

Eating fresh produce has long been promoted as a healthy option for consumers (see the promotion of the international 5+ a day programme, [www.5aday.co.nz](http://www.5aday.co.nz)). While health benefits have not been valued, the health benefits of eating fresh produce are integral to efforts to increase consumption of fresh fruit and vegetables. Imported fresh produce add variety and supply all year round in a competitive market crowded with other less healthy consumer products.

Importing Pacific fresh produce promotes New Zealand South Pacific economic development aims. By increasing the volume and value of imports of fresh produce from the South Pacific, New Zealand can contribute to the region's prosperity. This is important given that these island nations have a relatively narrow range of products and services from which they generate wealth through exports on a sustainable basis. The ongoing availability of an on-arrival MB contingency fumigation option is a critical part of maintaining these historic and important trade links.

New Zealand's export profile means that more containers are needed for the export trade relative to the import trade. Importers who backload cargo are able to obtain discounts from shippers of between 5% and 15% on freight rates (\$2.1 million and \$6.2 million). A significant portion of these cost savings are passed on to consumers.

### **Adverse Effects of removing Methyl Bromide as an acceptable fumigant for imported fresh produce**

As there are no known, approved and commercially available alternatives to MB use that replace all of the functions of MB presently performs, all consignments of imported fresh produce (infested with pests detected at the border) that would be directed for treatment, where MB has been the importers' preferred MPI approved treatment, will instead be directed for re-shipment or destruction. This will have a significant impact on New Zealand's importations and subsequent consumption of fresh fruit and vegetables. Re-shipping or destroying goods is very costly to importers, creates consistency issues and reduced predictability in terms on ongoing supply and the associated costs of that supply.

Direct costs of approximately \$9.6million of citrus, \$1.6million of grapes, and \$0.3million of Australian vegetables (duty value) imported by NZ FPIA members would be lost from the New

Zealand economy (based on historically recognised volumes). The impacts and losses associated with Pacific Island imports would also be significant and would run into millions of dollars of lost trade

<b>Crop imported by FPIA members</b>	<b>Approximate FOB Value (total consignments)</b>	<b>Percentage Fumigated with MB</b>	<b>FOB Value of Consignments Fumigated with MB (2017)</b>
Citrus (Australia, USA)	\$25million	38%	\$9.6million
Grapes (Australia, USA, Chile)	\$15million	10.6%	\$1.6million
Australian vegetables (mid-winter)	\$8.9million	3.3%	\$0.3million
<b>Total</b>	<b>\$48.9million</b>	<b>17.3</b>	<b>\$11.5million</b>

Source NZ FPIA

Note: Figures are estimated and seasonal.

### **Alternative treatments**

Of the total of 16,359 consignments of fresh produce imported in 2018, 8,701 were treated (53%). Of that, 2061 consignments of imported fresh produce were fumigated with MB.

Only one on-arrival MPI approved treatment, as an alternative fumigant to MB, has been available and used by NZ FPIA members i.e. hydrogen cyanide for bananas. This is a specific pest/crop combination which has been proven effective and is accepted internationally but does not have a broad spectrum of use when compared to MB treatment applications.

MPIs Standard Approved Biosecurity Treatments MPI-ABTR for fresh fruit and vegetables lists only two treatments for arthropods as an alternative to MB, i.e. freezing and hydrogen cyanide. Hydrogen cyanide is only approved for bananas and pineapples for surface pests. Freezing renders the product unsaleable or not fit for human consumption.

There are a range of new approaches being looked at internationally. Chemicals that show some promise as replacements include ethyl formate, hydrogen cyanide, sulphuryl fluoride and nitrous oxide. Non-chemical approaches include controlled atmosphere and irradiation treatment.

Like many overseas authorities, MPI requires a very high level of proof to accept a new treatment. New Zealand is a small market, and producers overseas do not have the same incentive to produce data to enable exports specifically to New Zealand. It is therefore unlikely that New Zealand would be presented with data for replacement treatments for the pest/commodity combinations that could be detected at the border and would have commercial application as an on-arrival contingency treatment option.

Product presented at the border with pests can be treated to remove the pest of concern, destroyed, or reshipped. Where there are no treatments available, reshipment or destruction are the only options. New Zealand already has a reputation for being an increasingly difficult market to enter and maintain. New Zealand is under increasing pressure to show that it is a trading nation and is prepared to accept exports from other countries, including the application of on-arrival contingency treatment options. The removal of MB as a facilitator of trade into New Zealand (followed by the subsequent removal of many of the other chemicals used on specific pests) may be seen as a potential or deliberate non-tariff trade barrier.

Unduly affected in this situation are countries who often cannot effectively manage the treatment options pre export that more developed countries use. As noted in Tables 1 and 2 above, a high percentage of Pacific fresh produce consignments into New Zealand required treatment on arrival. This is particularly so for several of the Pacific Island nations that New Zealand is deliberately engaged with to encourage trade.

## Conclusions

- MB is recognised by the International Plant Protection Convention (IPPC) as a named fumigant available to enable international trade. MB was regulated internationally (Montreal Protocol 1990) with a mandate for all countries to reduce MB use to zero, except for phytosanitary requirements where acceptable fumigation replacements do not exist.
- Quarantine treatments using MB as fumigant in New Zealand are important contingency options for on arrival consignments of imported fresh produce to remove the risk from harmful pests that are intercepted from time to time. There are no acceptable fumigant replacements (except for hydrogen cyanide for bananas and pineapples).
- The use patterns of MB, as an on-arrival contingency option for fresh produce, have remained relatively static over recent years. Whilst the frequency of use is high (i.e. over many consignments imported throughout the year), the actual volume of MB used for this purpose is very small and continues to be only a very small fraction of the total use in New Zealand (i.e. less than 1%).
- MB fumigation treatment of imported fresh produce provides continued, sustainable and predictable opportunities for the year-round supply of fresh produce imports to supplement the needs of the retail and consumer sector in a cost-effective manner.
- The on-arrival MB option also provides for a range of important trade and economic benefits for many country/commodity combinations. This includes our Pacific Island trading partners.

- Available MB recapture technology will not deliver 5ppm MB in head space following MB fumigation without loss of product due to deterioration during the recapture process.

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