

**Copper Use on Various Crops in Hawaii and on Betel Nuts on Guam -- Updated (for Copper Master Label Data File)**

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Date: June 22, 2006

To: [Ron Landis](#); [Ted Rogers](#)  
CC: [Mike Kawate](#); [Rick Melnicoe](#)

From: [Cathy Tarutani](#)

Subject: Hawaii Use Data

[Attachment 1: Copper Refined Actual Use Rates for Papaya -- Hawaii](#)

[Attachment 2: Copper Refined Actual Use Rates for Crops -- Hawaii](#)

Ron,

Thank you for the call acknowledging the receipt of Hawaii's information.

Attached is the spreadsheet of Hawaii use data including information for papaya. Numbers which are larger than the previous version of the spreadsheet from the Task Force are indicated in red.

Also attached is some explanation for the papaya numbers. As you can see, a limitation of 5 applications per year is inadequate for papaya growers in Hawaii.

Regarding betel nut, this crop did not appear on any versions of the Task Force spreadsheets. The numbers are based on a 24(c) registration for Guam and a conversation with a pathologist on Guam.

Copper is not used every year on betel nut on Guam, but only when there is an outbreak of the disease.

If you have any questions or concerns, please contact me.

Thank you,  
Cathy

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## Copper Refined Actual Use Rates for Papaya--Hawai'i

Crop	Maximum per Application Rate (lbs Cu <sup>2+</sup> /A) <sup>1</sup>	Maximum Seasonal Rate (lbs Cu <sup>2+</sup> /A) <sup>2</sup>	Minimum Retreatment Interval <sup>3</sup>
Papaya	2.5	21.2	14 days

Papaya is a crop which is in year-round production. The papaya crop is also vulnerable to pest pressures year-round. Collectively, fruit rots are major pests for papaya production and their control presents major challenges for growers.

Culture of papaya is unique to the situation in which it is grown. A large percentage of Hawaiian papayas are grown without irrigation in the high rainfall areas of the state. Practices applicable to irrigated papaya fields may not be applicable to those grown without irrigation. Papaya is produced commercially on six of the main islands in the state with most of the acreage on the island of Hawai'i (the Big Island).

The above table represents a composite of actual practices for papaya production across the state of Hawai'i.



The theoretical maximum need for copper for papaya production in Hawai'i would occur in a year with high but intermittent rainfall. If such conditions were to occur, growers would need to apply *every 2 weeks*. The maximum seasonal rate would be higher (than indicated above), but growers who encounter such conditions in one year would use a lower single application rate:

Crop	Maximum per Application Rate (lbs Cu <sup>2+</sup> /A) <sup>1</sup>	Maximum Seasonal Rate (lbs Cu <sup>2+</sup> /A) <sup>2</sup>	Minimum Retreatment Interval <sup>3</sup>
Papaya	1.06	27.56	14 days



## Copper Refined Actual Use Rates for Papaya--Hawai'i

Such conditions, however are so rare, that we consider a Maximum Seasonal Rate of 21.2 lbs Cu<sup>2+</sup>/A (20 applications/year) to be more reasonable. Even this year, when, according to NASS, fresh papaya utilization is down 28% from the same time last year because of wet weather, growers will not apply the theoretical Maximum Seasonal rate of 27.56 lbs Cu<sup>2+</sup>/A. Much of this loss was due to disease because constant rain prohibited growers from treating their orchards. According to NASS, this year, production from windward Oahu crops decreased due to acreage lost by wet weather during March. Those fields have not produced quality fruits since the extended spell. Planting schedules increased to replace the abandoned fields. Even when there is less rainfall, rain events often prohibit growers from applying pesticides on a desired, regular schedule. Therefore, growers in areas affected by frequent rainfall are likely to apply the lower rate for a practical maximum of 20 applications/year:

Crop	Maximum per Application Rate (lbs Cu <sup>2+</sup> /A) <sup>1</sup>	Maximum Seasonal Rate (lbs Cu <sup>2+</sup> /A) <sup>2</sup>	Minimum Retreatment Interval <sup>3</sup>
Papaya	1.06	21.2	14 days



Growers who use higher application rates generally would treat less frequently, using fewer applications per year: The highest maximum single application rate would not be used for very many applications in one year.

Crop	Maximum per Application Rate (lbs Cu <sup>2+</sup> /A) <sup>1</sup>	Maximum Seasonal Rate (lbs Cu <sup>2+</sup> /A) <sup>2</sup>	Minimum Retreatment Interval <sup>3</sup>
Papaya	1.6	20.8	21 days



- 1 – Maximum pounds of metallic copper applied to an acre for each application.
- 2 – Maximum amount of metallic copper applied to an acre per each growing season.
- 3 – Minimum number of days between each application.

## Copper Refined Actual Use Rates for Crops--Hawai'i

Crop	Maximum per Application Rate (lbs Cu <sup>2+</sup> /A) <sup>1</sup>	Maximum Seasonal Rate (lbs Cu <sup>2+</sup> /A) <sup>2</sup>	Minimum Retreatment Interval <sup>3</sup>
<b>TREE CROPS</b>			
Banana	2	2	n/a (1 application/year)
Coffee	3	9	30 days
Mango	3.2	28.8	42 days
<b>VEGETABLES</b>			
Beans, Green	1.5	6	7 days
Celery	1	4	7 days
Crucifers (Broccoli, Brussels Sprout, Cabbage, Cauliflower, Collard Greens, Mustard Greens, Turnip Greens)	1	4	7 days
Cucurbits (Cantaloupe, Cucumber, Honeydew, Muskmelon, Pumpkin, Squash, Watermelon)	1.5	6	7 days
Eggplant	1	4	7 days
Pepper	1.5	6	7 days
Tomato	2	8	7 days
<b>MISCELLANEOUS</b>			
Litchi	1.5	6	7 days
Papaya	2.5	21.2	14 days
<b>Betel Nut (Guam)</b>	0.75	8.2	7 days

1 – Maximum pounds of metallic copper applied to an acre for each application.

2 – Maximum amount of metallic copper applied to an acre per each growing season.

3 – Minimum number of days between each application.