WASHINGTON STATE UNIVERSITY
TRI-CITIES

December 27, 2006 Ref: 2006-16-1

Jill Bloom, Review Manager
US Environmental Protection Agency
Office of Pesticide Programs
Special Review and Reregistration Division (7508P)
Ariel Rios Building
1200 Pennsylvania Avenue, N. W.
Washington, DC 20460

Subject: Comments to Docket EPA-HQ-OPP-2004-0202 on the PCNB RED

In February 2005, at EPA's request, the Pacific Northwest (PNW) Workgroup of the Western Integrated Pest Management Center provided USDA with the attached information on the use of PCNB on selected crops. The PNW Workgroup now offers the following comments on EPA's recently issued the Reregistration Eligibility Decision (RED) document for PCNB. We are pleased that EPA has agreed to retain PCNB use on ornamental bulbs and to retain a 12-hour REI; however, proposals to cancel potato and turf uses and to cancel broadcast applications to ornamental bulbs are all problematic for PNW growers.

POTATOES

PCNB is viewed as a critical tool in PNW potato production and is used on 20% of Idaho's potato acreage, 38% of Washington's acreage, and on 5% of the Oregon potato acreage. PCNB is primarily used for the control of back scurf but it is also used for the suppression of white mold and black dot. Continued use of PCNB in PNW potato production is viewed as critical because, while other fungicides are available for use, PCNB has remained effective over a long period of time and is viewed as an important tool in the industry's efforts to avoid the development of disease resistance. Further details of PCNB use in PNW potatoes are provided in the attached letter. We are asking that EPA retain both the in-furrow and chemigation use of PCNB on potatoes.

BULBS

EPA's proposal to prohibit all broadcast applications of PCNB is problematic for one segment of the cut flower industry. In Washington, iris are grown in greenhouses for cut flower production. In this situation, PCNB is broadcast applied to beds that are 3.5 feet wide and 150 feet long. We are asking that EPA allow for broadcast applications of PCNB in situations where it is applied to greenhouse soils.

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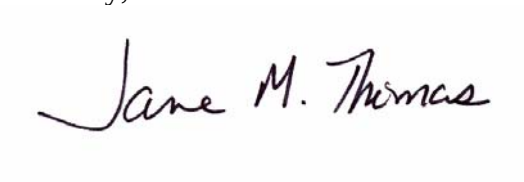
TURF
As stated in the attached letter, PCNB is an important tool for use on PNW golf courses because:

- it is used as a rotational product in IPM programs,
- it provides a curative treatment for fusarium patch,
- it is inexpensive to use, and
- it provides dependable control.

We ask that EPA reconsider its decision to delete all PCNB turf uses and allow for use on golf courses.

Sincerely,



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WASHINGTON STATE UNIVERSITY
TRI-CITIES

February 23, 2005 Ref: 2005-2-1

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I am responding to your inquiry, forwarded to me from Rick Melnicoe, Director of the Western Integrated Pest Management Center, on January 28, 2005, regarding the use of the fungicide PCNB on cotton, garlic, ornamentals, peppers, potatoes, succulent beans, soybeans, tomatoes, and turf. This response provides information for the Pacific Northwest states of Alaska, Idaho, Oregon, Montana, Utah, and Washington.

Of the crop and usage sites for which you seek information, PCNB is used in the production of potatoes, ornamental bulbs, golf course turf, and ornamentals in the Pacific Northwest. A description of each use is provided below.

POTATOES
PCNB is an important product in potato production in our region and is viewed as a critical tool by many growers. PCNB is used on 20% of Idaho potato acreage and approximately 38% of Washington acreage. The PCNB product most commonly used in potatoes is marketed under the trade name Blocker. This fungicide is used primarily for the control of black scurf/stem canker (*Rhizoctonia solani*), a disease that, if not properly controlled, can reduce both the quality and yield in potatoes. PCNB is also used for the suppression of white mold (*Sclerotinia sclerotiorum*) and black dot (*Colletotrichum coccodes*). Many growers in our region annually rely on PCNB for disease control.

For the control of black scurf and black dot, PCNB is applied as an in-furrow band treatment made over the seed pieces at planting. For in-furrow applications, PCNB is applied at a rate of 10# ai/12,400 linear feet of row or 0.8# ai/1000 linear feet of row. For white mold and black dot suppression, PCNB is applied by chemigation as one ingredient in a tank mix with fluazinam (Omega), boscalid (Endura), and sometimes iprodione (Rovral). Here PCNB is applied at a rate of 1.5 to 5.0# ai/A. The chemigation use of PCNB is very important in our region; in Washington chemigation accounts for between 75 and 80% of the PCNB use on potatoes. Directions for the chemigation use of PCNB are provided for via SLNs in Idaho, Oregon, and Washington.

Other fungicides available to potato growers are azoxystrobin (Amistar, Quadris), fluazinam (Omega), boscalid (Endura), iprodione (Rovral), flutolanil (Moncut), flutolanil + mancozeb (Moncoat MZ),

thiophanate methyl+ mancozeb (Tops MZ), and fludioxonil + mancozeb (Maxim MZ). Azoxystrobin has been found to be less effective for control of Rhizoctonia species than PCNB and growers have reported mixed results using flutolanil (Moncut) and flutolanil + mancozeb (Moncoat MZ).

Although other materials are available for use, PCNB is important to the potato industry because it has remained effective over a long period of time. PCNB is viewed as a critical tool to help avoid the development of disease resistance in potatoes.

ORNAMENTAL BULBS
PCNB is very important in Oregon and Washington's bulb industry where it is used in tulip, lily, and iris production.

Bulbous Iris and Tulip: In tulip and bulbous iris production PCNB is used to control gray bulb rot (*Rhizoctonia tuliparium*) and crown rot (*Sclerotium rolfsii*). It is used both in greenhouses where bulbs are grown for cut flower production and in the field where plants are grown for both bulb and flower production. In both, PCNB use is viewed as critical. Until Washington State's SLN, WA-040032, was issued last year for the use of flutolanil (Moncut) on field-grown bulbs, PCNB was the only chemical available for the control of Rhizoctonia species, including gray bulb rot. Although this SLN has the potential to create an important alternative, Dr. Gary Chastagner of Washington State University is not recommending growers currently using PCNB switch to flutolanil because of mixed test results.

PCNB is important to the bulb industry because, while it is applied at planting, the period where the field control is needed extends from February through July. Other fungicides don't last as long in the soil as PCNB and hence don't provide the control that is required. Disease levels are slow to build in soils; however, if growers don't get good control, the inoculum levels continue to build in the soil and in the bulbs. PCNB use is critical in bulbous iris production; according to Dr. Chastagner, the loss of PCNB would likely lead to the demise of the bulb industry, particularly iris production.

In field-grown bulbous iris and tulip bulb production where PCNB is used to control both crown rot and gray bulb rot, it is used as an in-furrow application made at the time of hilling. PCNB is not generally used in daffodil production because these bulbs are not susceptible to gray bulb rot. The PCNB use rate depends upon the inoculum level present in the soil. For a preventative control program PCNB is used at 2.0 to 3.4# ai/1000 linear feet of row. If an outbreak occurs, growers would use the high-end rate of 4.5# ai/1000 linear feet of row.

In greenhouse cut flower production, PCNB is used where bulbous iris and lily bulbs are planted directly in soil as opposed to containers. Here PCNB is broadcast applied to greenhouse soils at least once following fumigation and may be applied a second time between crops if the need arises. PCNB is applied as a broadcast spray, rototilled into the soil, and watered in. A spokesperson for one bulb company told me that, after many years without crown rot and many years of not using PCNB, his company had recently resumed use of PCNB after an outbreak of the disease. In this case the treatment is an eradication program, as opposed to a control program, and the company is using 3 to 4 gallons of a 4# ai/gallon product per 3500 square feet of soil.

Easter Lily: PCNB is also essential in both greenhouse and field-grown Easter lily production. One hundred percent of the field grown Easter lily bulbs are treated (dipped) with PCNB. PCNB is used to

control Rhizoctonia and is needed because of its long residual. Bulbs remain in the ground for 13 months so a fungicide with a long residual is needed. Easter lily producers also use carboxin (Vitivax); however, it is used in combination with and not in lieu of PCNB. Carboxin is a systemic and is used where there is deep tissue infection. PCNB, while only effective on the bulb surface, is important because of its longer residual. No other chemicals have been found to be both effective and to have the necessary residual.

Easter lily bulbs are a three-year crop and the bulbs are dug, dipped, and replanted each year. The bulbs are dipped in a solution of 1.5 to 4.5# PCNB (2.0 to 6.0# Terraclor) per 100 gallons of water and are soaked from 15 (minimum) minutes to 1 hour before being replanted. The PCNB use rate depends upon the severity of the infection. The use of PCNB also controls bulb mites, as these feed on infected tissue.

In Easter lily production, PCNB is also used in the greenhouse crop. Containers of newly potted bulbs are drenched with a solution of 4 oz PCNB in 100 gallons of water. While PCNB is not currently soil-applied (broadcast or in-furrow) in field-grown Easter lilies, these treatment methods would be important if there were future outbreaks of *Sclorotium rolfsii*.

Rhizomatous Iris: In rhizomatous iris production, PCNB is also important. It is used to control mustard seed fungus (*Sclerotium rolfsii*), known as crown rot in other crops. This soil-borne fungus is persistent in the soil and is found on many of the crops commonly grown in the Pacific Northwest. Because of the prevalence of the causal organism in so many crops, rotating land out of iris production for several years has no effect on the level of mustard seed fungus in the soil. One grower predicted that without PCNB, the rhizomatous iris industry could be wiped out in as little as three to five years.

Rhizomatous iris is a 10- or 11-month crop, planted in August or September and harvested in July. PCNB is a good choice for the control of mustard seed fungus because of its long residual. Its use has nearly eradicated this problem in the rhizomatous iris-growing areas of Oregon. While some have advised the use of triadimefon (Bayleton) for this control, growers in Oregon have not found it to be nearly as effective as PCNB.

In rhizomatous iris production, PCNB is applied at planting. After plants have been placed in the open furrows, they are drenched with a PCNB solution of 9 oz Terraclor per 1000 sq. ft. The furrow is then closed to prevent breakdown of chemical by sunlight.

Oregon iris growers are also very interested in obtaining a label that would allow iris rhizomes to be directly treated (dipped and sprayed) with a PCNB solution. They feel that this would greatly enhance their efforts to control mustard seed fungus.

Asiatic, Oriental, and Trumpet Lily: In our region PCNB is also used in bulb production operations for Asiatic, oriental, and trumpet lilies. One hundred percent of the bulbs planted for bulb production are dipped in PCNB as a preventative treatment for crown rot. Because this organism is difficult to control, growers utilize a preventative treatment program. The bulbs reach maturity over a three-year period. They are dug and treated with a PCNB dip before being replanted each year.

TURF
PCNB is not used extensively on home lawns in our region. It is, depending upon disease pressure, sometimes used on sod farms for the control of fusarium patch/pink snow mold (*Microdochium nivale*) in rotation with other fungicides. The most important PCNB turf use in our area is on golf course putting greens and tees. On newer golf courses planted in bentgrass, PCNB is also used on fairways. PCNB is used on almost all golf courses for the control of fusarium patch where it is used in rotation with other fungicides such as fludioxonil (Medallion), polyoxin D zinc salt (Endorse), pyraclostrobin (Insignia), and chlorothalonil (Daconil). It is also used, again in rotation, in the colder and drier portions of our region as a preventative treatment for grey snow mold (*Typhula* spp.). The use of PCNB is viewed as critical because, while there are other chemicals that are applied as preventative treatments for fusarium patch, PCNB is needed as a curative treatment when outbreaks occur. Other products do not provide this type of control. Further, PCNB is used extensively because it is inexpensive and provides dependable control.

For gray snow mold control, PCNB is applied once in the fall just before snow falls at 0.3 to 1.0# ai/1000 sq. ft. For fusarium patch, PCNB is typically applied 2 or 3 times a year at 0.3 to 0.5# ai/1000 sq. ft.

ORNAMENTALS
In our region PCNB use varies in ornamental production where it may be used to control Rhizoctonia, damping off, and rots in general. It is sometimes used in nurseries in rotation with other fungicides such as fludioxonil (Medallion) or *Trichoderma harzianum rifai* (Plantshield) for resistance management. Other control measures such as mefenoxam (Subdue), or etridiazole + thiophanate methyl (Banrot) are available; however, they are more expensive than PCNB. PCNB is more important in greenhouse settings where it is used as a soil drench. At one company, the grower estimates that between 25 and 35% of the plants produced by their greenhouse are treated with PCNB.

Greenhouse growers are very interested in retaining the ability to use PCNB for several reasons: it is effective, the 12-hour REI makes it a usable alternative for greenhouse operations, and it is not as hard on young plants as some of the alternative fungicides (e.g., copper). Several growers commented that while they hadn't used PCNB in some years, it is a tool that they would not want to lose.

GARLIC and ONION
PCNB is not currently used in garlic production in our region, although in the past it was used for the control of white rot (*Sclerotium cepivorum*). White rot is the pest of greatest risk to garlic (*Allium sativum*) production throughout the United States and is also a risk to onion (*Allium cepa, Allium fistulosum*) production where onions are grown either over-wintered or in otherwise cool conditions. White rot is not a risk to spring-planted/fall-harvested onions grown in very hot regions.

According Oregon State University's Dr. Fred Crowe, white rot is the most serious disease affecting onions and garlic. It typically kills Allium plants before harvest; however, if bulbs are infected late in the season, white rot can also become a storage rot. Currently there are no alternative fungicides or cultural treatments available for white rot control in onion or garlic and the Allium industry is seriously in need of effective tools. Efforts are made to control the spread of white rot into onion and garlic-producing areas through the use of both quarantines and field/crop certification programs; however, despite these efforts white rot continues to spread. In most regions, fields are permanently abandoned

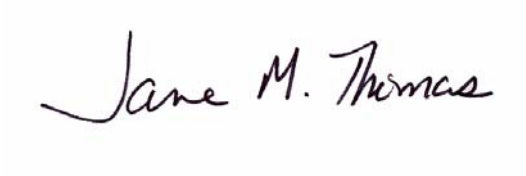
for future Allium production when white rot is detected in either garlic or onion crops, eventually rendering entire regions unavailable for Allium production.

The fungicide tebuconazole (Folicur) has provided partial control of white rot on onions in other countries, but has been difficult to apply in a manner that both provides control and prevents phytotoxicity to onion seedlings. On garlic, tebuconazole has been more effective. While it is labeled for use on garlic in Mexico, it is not labeled for this use in the United States due to toxicity concerns.

Dr. Crowe has recently begun exploring the possibility of using PCNB in combination with fludioxonil (Scholar/Maxim) to control white rot in onions and garlic. While fludioxonil has shown promise for controlling white rot, the control is not sustained through the end of the growing season, thus used by itself it does not provide reliable control. Dr. Crowe hopes that the use of this product in combination with PCNB will provide season-long control of white rot. Field trials have not yet begun in either onion or garlic but Dr. Crowe hopes this will occur in onion this spring and in garlic in the fall.

I hope that you find this information useful. I am attaching a contact list for your use should you have any additional questions

Sincerely,



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Contact List for PNW PCNB Use

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bean, succulent	Gill	Jim	Norpac Foods	Agriculture Research and Development Manager	(503) 769-2101	gill@norpac.com	Oregon
bean, succulent	Miklas	Phil	US Department of Agriculture	Research Plant Geneticist	(509) 786-2226	pmiklas@pars.ars.usda.gov	Washington
bulb	Chastagner	Gary	Washington State University	Plant Pathologist	(253) 445-4528	chastag@wsu.edu	Washington
bulb	Ernst	Rick	Cooley's Gardens	Owner	(503) 873-5463	ernstriris@verizon.net	Oregon
bulb	Finch	Jim	Washington Bulb Company	Greenhouse Manager	(360) 424-5533	jimf@wabulb.com	Washington
bulb	Mak	Johan	Mak-Leek Inc.	Owner	(503) 394-4455		Oregon
bulb	McKenzie	Kelly	Vandersalm Bulb Co.	Sales Representative	(360) 263-2180	kelly@americanlilies.com	Washington
bulb	Riddle	Lee	Easter Lily Research Foundation	Research Station Manager	(541) 469-2215	elrf@woods-computers.net	Oregon
bulb	Roozen	John	Washington Bulb Company	Owner	(630) 424-5533	john@wabulb.com	Washington
bulb	Schreiner	Dave	Schreiner's Gardens	Owner	(800) 525-2367	wholesale@schreinersgardens.com	Oregon
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garlic	McReynolds	Bob	Oregon State University	Extension Horticulturist	(503) 678-1264	bob.mcreynolds@oregonstate.edu	Oregon
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nursery/ornamental	Barney	Dan	University of Idaho	Extension Professor	(208) 263-2323	dbarney@uidaho.edu	Idaho
nursery/ornamental	Daniels	Stephanie	Bells Nursery		(907) 345-4809	none	Alaska
nursery/ornamental	Elliot	Allan	Carlton Plants LLC		(503) 868-7971	carltonp@viclink.com	Oregon
nursery/ornamental	Hiller	Mike	Alpha Nursery	Manager	(503) 390-1286	mike@alphanursery.com	Oregon
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