A PROPOSAL TO THE NATIONAL WATERMELON ASSOCIATION
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PROJECT TITLE
Forecasting long-distance movement of cucurbit downy mildew: a decision-making tool for watermelon growers in 2008

PRINCIPAL INVESTIGATOR
Gerald J. Holmes
Department of Plant Pathology
North Carolina State University
Campus Box 7616
Raleigh, NC 27695-7616
Phone: (919) 515-9779
Fax: (919) 515-7716
Email: gerald_holmes@ncsu.edu

OBJECTIVES
1. Provide watermelon growers with bi-weekly forecasts for cucurbit downy mildew via a website.
2. Track outbreaks of cucurbit downy mildew by mapping confirmed reports of the disease and making maps available via the forecasting website.
3. Provide watermelon growers with current disease control recommendations, disease identification guides and the latest research results on cucurbit downy mildew via the forecasting website.

BACKGROUND AND JUSTIFICATION
Downy mildew, caused by *Pseudoperonospora cubensis*, is an important disease of all commercially grown cucurbits (i.e., cantaloupe, cucumber, pumpkin, squash, and watermelon). For pumpkin and squash growers in the eastern U.S., it is a yearly problem that typically occurs sometime after July 1. However, beginning in 2004, the disease became more important than ever before. In addition to the long-standing problem on pumpkin and squash, downy mildew became extremely virulent on cucumber, necessitating the use of fungicides where previously none were required. In watermelon, the disease is typically limited to Florida, but since 2004 has been a major problem for growers in NC and Delaware, Maryland and Virginia. Since 2004 downy mildew has spread far to the north and the west (e.g., Michigan, Ontario, Wisconsin, Ohio and Indiana) where it was either not previously reported or a rare occurrence.

Downy mildew poses a particularly difficult challenge for watermelon growers. On the one hand, the disease spreads so rapidly and control is so difficult that growers cannot afford to wait until they see the disease before making fungicide applications. On the other hand, if fungicides are applied season-long, the added cost to production can eliminate what little profit margin exists. Fungicides that are most effective against downy mildew (e.g., Previcur Flex, Tanos, Ranman) are not effective against the

common foliar diseases of watermelon such as gummy stem blight and powdery mildew. Consequently, if downy mildew occurs in watermelon, it will not be controlled by the fungicides that are typically used. A forecasting system is in place to help growers minimize costly fungicide sprays by timing their applications for when they are needed most.

Since 1998, forecasts for cucurbit downy mildew have been provided by NC State University to cucurbit growers throughout North America. Forecasts are based on meteorological models that predict wind patterns, and known sources of the disease reported by a network of state coordinators. The forecasts are issued on Tuesdays and Thursdays of each week between March and October and made available via a website (http://www.ces.ncsu.edu/depts/pp/cucurbit/). The forecasts are available, at no cost, to anyone with internet access.

Funding for the forecasting center was dramatically reduced in 2006, forcing us to seek additional funding in order to continue providing the service. We are seeking support from your organization because watermelon growers are active users of the forecasts. We are seeking support from at least 12 other grower organizations in the US and Canada in order to gain the support needed to operate the forecasting system in 2007. Website use has risen dramatically since 2004 and is currently at an all-time high (up to 4,800 hits per day in July 2006).

POTENTIAL OUTCOMES & SIGNIFICANCE

Fungicide applications are costly and growers cannot afford to make season-long applications. This is especially true for crops with small profit margins. Disease tracking and forecasts provide risk assessments that aid growers in timing their fungicide applications for when they are needed most. The benefits of these forecasts are greater for growers in the northern latitudes since they generally get the disease later than those to the south. Equally important has been the selection of effective fungicides since many of the old standards are not working against this disease. A disease management program developed in 2004 has been disseminated via the website and rapidly adopted by growers throughout the region.

ITEMIZED BUDGET

Personnel	$2,500
Equipment	–
Supplies	–
Other	–
TOTAL	$2,500

BUDGET NARRATIVE

Funds will be used to pay a portion of the wages for a meteorologist to produce forecasts and for a webmaster to post forecasts on the website. Support is also being sought from 12 other organizations. Support from multiple organizations will help us argue more effectively for continued support in other arenas.