Growing Healthy Crops and Healthy Profits
December 6-8, 2005
Grand Rapids, Michigan

Great Lakes EXPO
FRUIT, VEGETABLE & FARM MARKET

Pickling Cucumber

Tuesday morning 9:00 am

Moderator: John Swanson, Michigan Vegetable Council Board / EXPO Board

9:00 a.m. Using Herbicides to Manage Weeds in Cucumbers Effectively

Bernard Zandstra, Horticulture Dept., MSU

9:20 a.m. Using Cover Crops to Extend Productivity of Pickle Fields

Mathieu Ngouajio, Horticulture Dept., MSU

9:40 a.m. Pickle Packers International Programs in Support of the Pickle Industry

Brian Bursiek, Pickle Packers International, Washington, DC

10:00 a.m. Advances in Pickle Production in Delaware

Ed Kee, Univ. of Delaware. Georgetown, DE

10:30 a.m. Impacts of Downy Mildew on Pickle Production

Mary Hausbeck, Plant Pathology Dept., MSU

Impacts of Downy Mildew on Pickle Production

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On August 5, downy mildew was confirmed for the first time on cucumbers in Michigan. Later in the summer, it was also confirmed on yellow squash and zucchini. The widespread cucumber mosaic virus made matters worse. Downy mildew developed in several regions in Michigan including major vegetable production regions, and thousands of acres, primarily of cucumbers, were affected (Fig. 1). All cucurbit crops (pumpkin, squash, melons, zucchini, gourds) are potentially at risk from this disease. Downy mildew also caused devastating losses for growers in Delaware, North Carolina, Georgia, and other states in the southeast last year. Downy mildew was documented in Wisconsin (cucumber), Illinois (pumpkin, squash, watermelon), Indiana (pumpkin), and Missouri (watermelon).

Downy mildew causes symptoms on the leaves similar to a mosaic or angular leaf spot. The tell-tale symptom of downy mildew is the dark, purplish/gray fuzz on the underside of the leaf giving a somewhat "dirty" or "velvet" appearance. This fuzz may be most evident in the morning. Downy mildew is well-known for causing catastrophic losses in a brief period of time. When the conditions are favorable, unprotected foliage can become completely infected and appear to be frosted within 10 days of initial infection.

To win the war against downy mildew, chemical control must be focused on using the most effective products, alternating the products, and applying fungicides at short intervals. Results from our downy mildew research indicate that the most effective spray programs include the following: Previcur Flex (propamocarb hydrochloride, Bayer CropScience) plus Bravo (chlorothalonil, Syngenta Crop Protection) alternated with Tanos 50DF (cymoxanil + famoxadone, DuPont Crop Protection) plus mancozeb (or Tanos plus Bravo) (Fig. 2).

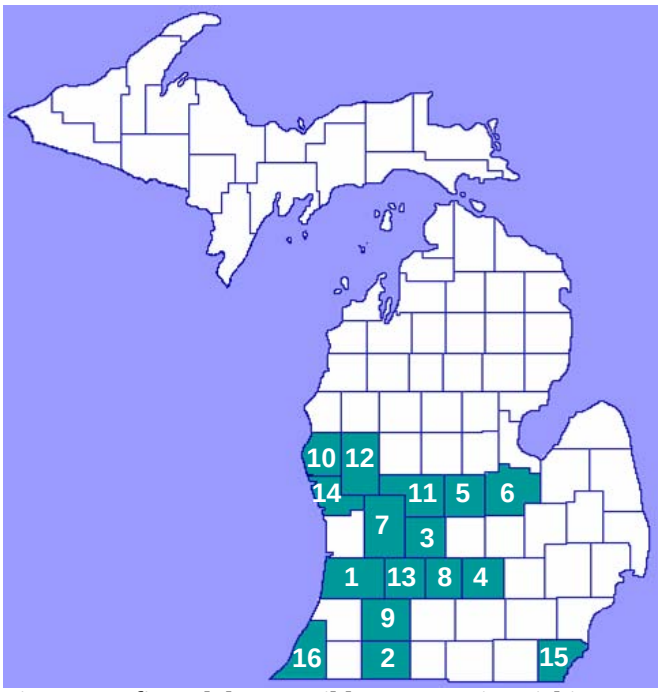

Fig. 1. Confirmed downy mildew reports in Michigan, 4 August-5 September, 2005. Numbers represent the order of downy mildew confirmation.

Our study was conducted in a young pickling cucumber field that was already showing early downy mildew symptoms and sporulation. Overall, fungicides are more likely to be effective when applied prior to the appearance of downy mildew. Previcur Flex was a critical component of the fungicide program (Fig. 3). It appeared to be especially effective and offered a different mode of action from that of Tanos 50DF. Tanos 50DF has a three-day PHI and Previcur Flex has a two-day PHI. The addition of mancozeb increases the PHI to five days. Bravo has a 0 day PHI. In addition to fungicide application, it was recommended that any infected vines remaining after harvest should be killed with an herbicide or plowed under immediately so that they do not serve as a source of downy mildew for nearby crops. The downy mildew pathogen cannot survive Michigan winters.

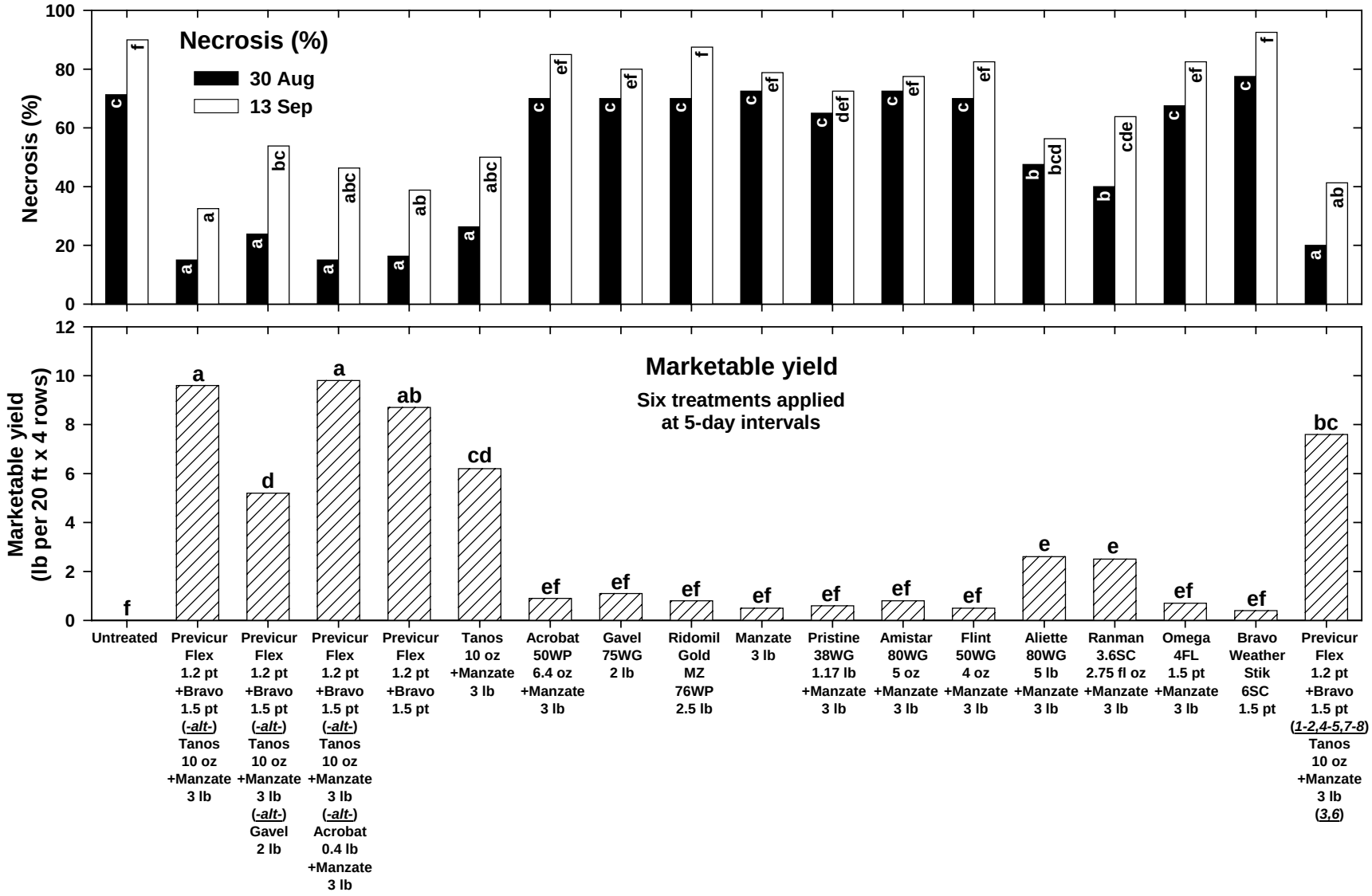

Fig. 2. Downy mildew trial on pickle. Six treatments were applied at 5-day intervals from 17 August to 12 September. Disease was rated on 30 August and 13 September, and yield was taken on 15 September. Bars with a letter in common are not significantly different.

Fig. 3. Downy mildew fungicide trial yield comparison. Untreated control (left) versus recommended program (right), Previcur Flex + Bravo alternated with Tanos + mancozeb.

Once downy mildew was confirmed as a serious threat to Michigan cucumber growers, cucumber cultivars in a germplasm trial were evaluated for this disease. Four cultivars remained disease-free during this trial: Cross Country, Lynx, PI 419009 and PI 606066. Industry standards 'Vlaspick' and 'Vlasspear' were susceptible. As it appears that downy mildew is a significant threat to U.S. cucumber growers, disease resistant cultivars are an important part of an overall disease management program.