Introduction

Carrot, Daucus carota sp. sativus are grown commercially in Wisconsin on organic and sandy soils across six counties. Commercially raised carrots are contracted to growers according to processing companies’ requirements for slicing and dicing varieties, which are later used in baby food, soups, vegetable mixes and frozen baby or cut n’ peel carrots from west coast processing companies’ requirements for slicing and dicing varieties, which are later used in baby food, soups, vegetable mixes and frozen baby or cut n’ peel carrots. Carrot cropping across the eastern US would not be sustainable and profitable if not for the utilization of pesticides to maintain adequate control of various yield reducing pests. Alternaria and Cercospora leaf blights, Figure 1 & 2 heavy weed pressure and influxes of Aster leafhoppers carrying the aster yellows phytoplasma force growers to make numerous chemical pesticide applications throughout the growing season.

Recently, several questions have been raised by the Food Quality Protection Act (FQPA) and processing companies, regarding the development of new cost effective reduced risk management strategies into commercial carrot production. The University of Wisconsin Department of Plant Pathology is actively contributing to five major objectives of the partnership and grant: 1. Establish baseline data reflecting current grower practices and IPM adoption by utilizing a designed survey instrument currently completed by 9 of 10 commercial growers. 2. Screen carrot varieties and advanced breeding lines for foliar disease tolerance or resistance. 3. Evaluate alternative fungicide preparations for control of Alternaria and Cercospora leaf blights. 4. Aid in the development of a disease forecasting and pest monitoring system, to better time fungicide applications. 5. Develop a carrot production system that minimizes or eliminates pesticide dependence.

Materials and methods:

A comprehensive integrated pest management survey, originally created for Wisconsin potato growers, was adopted for carrot production in 2001, to establish a database of current production techniques and assess the level of IPM adoption among Wisconsin growers. The survey instrument was initially mailed out to ten growers across Wisconsin, with a follow up phone call establishing a time for a one-on-one interview and collection of the completed survey. The interview consisted of first completing an unanswered survey questions and later discussing in detail the methods utilized in each operation. Nine of ten commercial growers were interviewed regarding production status, current cropping techniques, varieties grown and pesticide usage. The acquired survey information was compiled into a grower database, then analyzed and compared, creating an overall picture of current state-wide operation practices. The data were evaluated and transformed into tables, charts, graphs and narratives for each grower, with a final refinement into an overall summary of all Wisconsin carrot growing systems.

Results and Discussion:

Total carrot acreage among the nine growers surveyed was 2996 acres, with the average operation size being 330 acres and an average field size of 45 acres, yielding 25 to 35 tons per acre. Growers are utilizing F1 hybrid carrot varieties selected for high yield, root quality, shape, color and sugar content characteristics. Some growers are currently blocking, scouting and spraying varieties based upon their disease or pest tolerance characteristics, reducing the number of chemical applications and quantity of active ingredient per acre. All surveyed growers expressed the critical importance of field scouting and proper pest diagnosis to the overall success of their pest management programs. Through the use of more aggressive scouting and pest monitoring tactics, growers are now targeting pests with fewer chemical applications than in previous years. The reasons and methods for scouting fields differed among operations, but carrot growers are more frequently basing pest management decisions upon available field information and shifting away from weekly scheduled pesticide applications. Precision pesticide applications are utilized by growers, not only to keep input costs down, but also to minimize deleterious environmental impacts. Carrot growers are incorporating new pest tolerant varieties, and routinely monitoring and tracking pest pressure, thereby minimizing needless pesticide applications. With the incorporation of new reduced risk alternative pesticides, growers are now able to decrease active ingredient applied, while maintaining adequate pest control.

Future Contributions:

- The knowledge acquired through the IPM questionnaire and interview, will further focus our development of a stable, efficient, sustainable and reduced risk carrot production system for the eastern United States.
- Grower survey will be conducted again in 2005 to evaluate the adoption and implementation of Integrated Pest Management strategies over the duration of the five year study

References:


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Baseline Information on the Current Status of IPM Adoption Among Carrot Growers in WI

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Background:

A partnership among Eastern US carrot stakeholders and a USDA R.A.M.P. grant, originally proposed by Dr. Mary Hausbeck at Michigan State University, were initiated to develop and implement integrated pest management strategies into commercial carrot production. The University of Wisconsin Department of Plant Pathology is actively contributing to five major objectives of the partnership and grant:

1. Establish baseline data reflecting current grower practices and IPM adoption by utilizing a designed survey instrument currently completed by 9 of 10 commercial growers.
2. Screen carrot varieties and advanced breeding lines for foliar disease tolerance or resistance.
3. Evaluate alternative fungicide preparations for control of Alternaria and Cercospora leaf blights.
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