

CORN PEST MANAGEMENT PRACTICES OF DAIRY AND CASH GRAIN FARMERS IN WISCONSIN

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Abstract: University extension has worked to promote Integrated Pest Management (IPM) among Wisconsin farmers. Extension offers a single set of recommendations for corn IPM. Using data from a 2002 survey, this paper tests the hypothesis that corn and dairy farmers practice corn IPM similarly, and that a single set of recommendations is sufficient. The data illustrates that IPM practices differ significantly between the two groups of Wisconsin farmers. The paper attempts to explain the differences in terms of farm size and labor allocation, and suggests that extension should propagate a broader set of rules that could better accommodate the range of farmers growing corn.

Introduction

Long-standing concerns about the misuse of pesticides resulted in the University of Wisconsin Extension providing a leadership role in promoting guidelines for the use of Integrated Pest Management (IPM) practices among Wisconsin farmers growing corn. IPM is generally more labor and managerial intensive as it is dependent on insect, weed and disease information in corn fields at different times during the crop cycle. Ideally, these IPM recommendations would be simple and appropriate for all farmers to use. However, there is reason to believe that some farmers may be less likely to use IPM than others due to labor and managerial requirements. In particular, this study compares dairy farmers in Wisconsin who grow corn versus cash grain farmers. The null hypothesis is that corn pest management practices are identical with both cash grain farmers and dairy farmers.

The Survey Data

The data were collected from a survey conducted by the UW-Madison Department of Rural Sociology with technical assistance being provided by Chris Boerboom (Agronomy), Bryan Jensen (Horticulture) and Richard Proost (UWEX Nutrient and Pest Management Program). Two populations of Wisconsin farmers were sampled. A random sample equivalent to 1.5% of total Wisconsin corn growers as estimated from the Wisconsin's Agricultural Census of 1997 was selected from the Wisconsin Corn Growers membership list. An independent 1.5% sample, proportional by county, was drawn for dairy farmers identified in the same census. A mail survey using a instrument that measures pest management behaviors was developed and mailed to both of these samples. Response from corn growers was 136 out of 325 for a response rate of 41.8%. After adjusting the response rate due to retirements, death or other causes for exists from

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corn production, the adjusted response rate was 45.8%. For the dairy group, 78 responded out of 342 for a 22.8% response rate. The adjusted response rate was 25.0%. Overall, 214 out of 667 replied, for a basic response rate of 32.1%, and an adjusted response rate of 35.1%. These populations, of course, are not mutually exclusive. A farmer identified as a dairy farmer could also be engaged in a cash grain corn operation, and a farmer identified as a cash grain farmer could have a herd of dairy cows. Nonetheless, the data suggest that a simple cash grain/dairy dichotomy effectively captures fundamental differences between the groups.

Farm Characteristics

Those identified as cash grain farmer operated, on average, 859 total acres (rented or owned), whereas dairy farmer operated, on average 159 acres (owned or rented). The cash grain farmer keeps, on average, 19% of grain produced for on-farm use. This is contrasted with 84% kept for feed by the dairy farmers. Consistent with these last statistics we find that 54% of total farm income comes from the sale of grain for the cash grain farmers, but for dairy farmers only 5% of total farm income came from the sale of cash grain. Overall only one out of five (20%) farmers employed a crop consultant. Cash grain farmers were more likely to use a crop consultant (28%) versus the dairy farmer (6%). However, use of a crop consultant was positively related to the size of the farm operation regardless of whether it was cash grain or dairy.

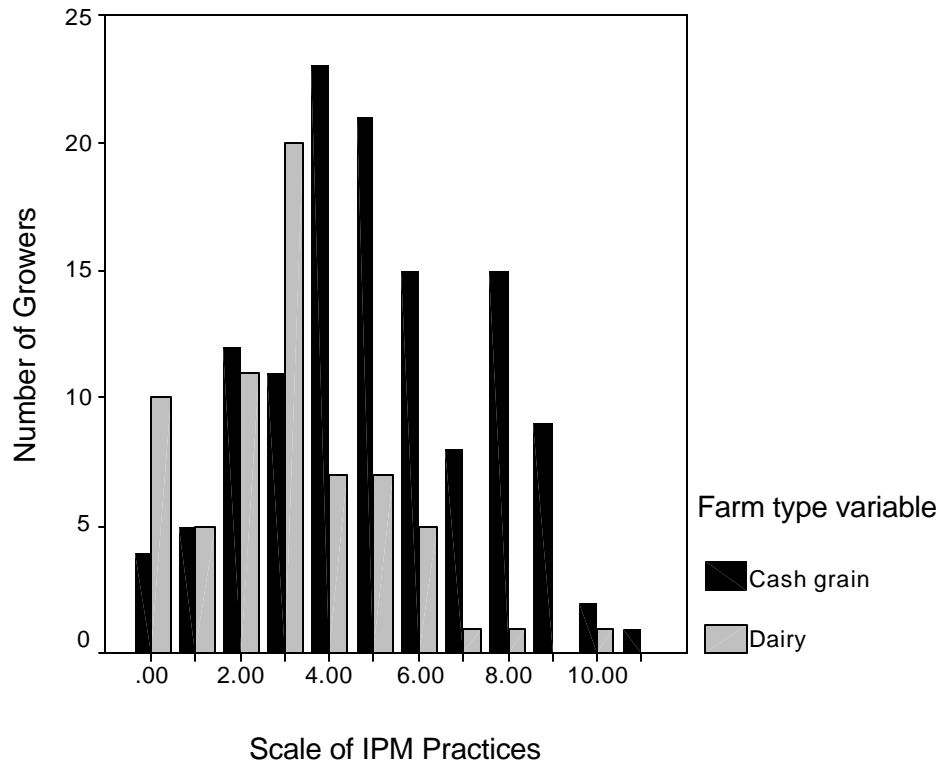
IPM Practices

The samples of cash grain and dairy farmers found two very different groups based on the above farm characteristics and other measures. At issue is whether they differ in the use of IPM practices. To measure this, an 11-item IPM practices scale was constructed based on technical recommendations and the published literature. A higher score indicates greater use of IPM practices. The binary variables comprising the scale were:

- Any scouting (self-defined) of crop fields
- Scouting by crop consultant
- Walking a W-shaped pattern when scouting the field
- Keeping written or electronic copies of scouting records
- Using pesticides only when recommended by experts (extension, agronomists or crop consultants)
- Only applying pesticides when scouting finds pests
- Rotating herbicide families to prevent weed resistance
- Rotating crops to reduce weeds
- Rotating rootworm insecticides to prevent insect resistance
- Rotating crops to control insects
- Rotating crops to control disease

Each 'yes' answer to these questions was marked a one, and each no answer a zero. Scale validity was tested using Cronbach's alpha, which resulted in a value of .75 which indicates a valid scale. Each respondent received an overall IPM score varying between 0 and 11. The overall IPM scale result was characterized by a normal distribution.

The study hypothesis was tested by comparing the IPM scales of cash grain and dairy farmers. The following graph shows the distributions of the IPM scale, divided by farm type:



The cash grain farmers had an average IPM scale score of 5.1 versus the average IPM scale score for dairy farmers of 3.0. These means are statistically significant at the .000 level based on an independent sample *t*-test. Farms that employed a crop consultant had higher average IPM scores (mean = 7.3) than those who did not use a crop consultant (mean = 3.6). Operators who also did their own scouting had higher IPM scores than those who did not, but these IPM scale values were significantly less than those who employed professional crop consultants. Finally, the size of operations and use of a crop consultant was also strongly and positively related to IPM scale scores; i.e., larger farms were more likely to employ crop consultants, and hence have higher IPM scale scores.

Discussion

Labor allocation decisions are a major reason why cash grain and dairy farmers practice IPM differently. Labor allocation also varies with the scale of the operation. Dairy farmers would be expected to spend less time on the labor-intensive IPM components since corn is only an input rather than a directly marketable good. Cash grain farmers are less willing to tolerate crop losses from weeds, diseases and insects, and so will pay more attention to IPM. Dairy farmers' labor is also more valuable focusing on herd management issues rather than engaging in IPM practices. In economic terms, the opportunity costs of corn IPM are higher for dairy farmers than for cash grain farmers.

The critical issue raised by the lack of support for the hypothesis is whether one set of IPM recommendations is sufficient for the diversity of Wisconsin's agricultural system. Is it possible to create a set of recommendations that reflects the diverse needs and capabilities of Wisconsin farmers? Based on the decline in the number of farms in Wisconsin in recent years coupled with increasing environmental and market pressures, it is hoped this objective can be achieved in the near future.