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Capstone Project

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Comparing IPM Recommendations

Abstract:

Crop management decisions are made every day based on information provided by universities and companies across the globe. In this project, the goal is to evaluate different sources and their recommendations for pest management. Each reference is assessed based on pest identification, pest management, management alternatives, decision making, implementation, and evaluation in the field. This evaluation will show some similarities and some differences between Industry and universities.

Introduction:

Integrated pest management (IPM) was adopted in the United States in the 1970s to use pesticides more responsibly. This new approach used biology and cultural control methods such as tillage to take care of pests without using harmful chemicals unless necessary. IPM has changed over the years; as technology has advanced, previously control of pest happened during the growing season, but now growers can control pests before the seed is even in the ground.

Extension and Industry both give growers recommendations when it comes to pest management, and the paper will examine the differences and similarities.

Congress created extension services to provide education on new research and techniques to producers. Extension is the bridge between university research and producers, so, just as research

must be bias-free, so does Extension, which shows in the recommendations they give. It also shows the level of information they can provide. While the information between the two sources is similar, there are a few areas where Extension was more helpful—the first being the identification of grubs. The cornfield scout guide provided excellent examples of rasters, and this information was unique to the extension information. The other information that Extension provides is the corn scouting calendar. It shows when to be on the lookout for pests and the overlap with insects. The Winfield united book does give the lifecycle of each insect. It does not include the overlap between problems. The last bit of information is; first, the field guides are available on the app store and make this guide more useful in the field. Lastly, it has calculators where you can estimate yield loss due to defoliation. This aspect makes the field guides user friendly, and the plus side is that this field is ten dollars, whereas the Winfield united guide is four hundred and twenty-five dollars.

Methods:

To compare industry and extension sources a rubric was created. The first category is Pest ID. For a score of "Proficient" the unit identifies pest insects for specific crops and has additional information like life cycle or a scouting calendar. Emerging identifies only the pest and beginning does not mention pests. The next category is pest management. This category evaluates ways a pest can be controlled. Proficient provides specific management recommendations that includes thresholds and control methods. Emerging would have just thresholds. Next is alternatives proficient would list other management ideas like early plants or tillage. Emerging would just mention chemical controls. Decision making this category looks at

the information and evaluates if it can be used to make future decisions. Proficient would allow growers to make decisions before the growing season and during the growing season. Emerging might just offer information to use during the season and beginning would offer information that might be valuable post-harvest. Implementation evaluates management restrictions. Proficient will include restrictions that a control measure might have an example would be dicamba buffers. While emerging would not mention restrictions. Lastly Accessibility. This evaluates how user friendly each product is and how accessible the product is to producers. Proficient is user friendly meaning easy to use in the field and cost effective. While emerging might be that it is user friendly but not cost effective and beginning is that it is not user friendly or cost effective.

Category	Winfield	Purdue
Pest Id	+5 Proficient Provides Pest identification and pest lifecycle. This source also provides separation between above and below ground pests.	+5 Proficient Provides pest Identification and a scouting calendar and the overlap between pests
Management	+5 Proficient provides thresholds and control methods	+5 Proficient provides thresholds and control methods
Alternatives	+5 Proficient offers different options early planting etc. Chemical control is also mentioned, and this list is a little more extension it has toxicity to bees present as well.	+3 Emerging offers only chemical control recommendations
Decision making	+5 Proficient provides information on pre planting decisions like seed treatments and in season information and post harvest information	+5 Proficient Provides post-harvest and pre harvest information
Implementation	+5 Proficient mentions potential restrictions Example bee toxicity	+3 Emerging Does not mention potential restrictions
Accessibility	+0 Beginning	+5 Proficient

	This book cost $425 and is not accessible to most producers there is a limited number produced each year. The app is only accessible to people that use Winfield united products. The book is large heavy and would not be recommended to take in the field	This guide printed is $10 and the app is $5 dollars for the corn field guide. This is user friendly. The printed version is also better in the field it can fit in your pocket.

Discussion:

Industry has similar recommendations for thresholds and similar information when it comes to the number of insects they identify. However, the Winfield United book did provide more information when it came to insects because their target group is not just Indiana or the Midwest but rather the United States. The Winfield United book provided information on insects; for example, they had information on Chinch bugs, Bill Bugs, Sod webworms, Southern corn leaf beetle, and Spider mites. The Purdue Field Guide did not mention those insects in the corn field guide. The industry book did a great job in the management of Black Cutworm and European corn Borer. These insects had pages on calculating yield loss due to these insects. It is essential to mention that Winfield United adapted most of this information from the University of Illinois. The industry field guide does provide better information when it comes to identifying an insect. It has sperate information for above and below ground pest, which is beneficial for pest management because you must know what you are trying to control. The following helpful information is the difference between thresholds between great plains and corn belt. One example is the management of Corn Rootworm in the corn belt; if 25-50% of the plants have silk

clipping ½ inch in length during pollen shed, then Producers should apply chemicals, while in the great plains, control should be used when 8-10 beetles are present per plant before plants have started to silk. Industry and Extension's most significant difference is that Industry can and will recommend specific products; for example, Gaucho, Poncho and Cruiser were all recommended by this book. It is important to note that this book is only available to a dealer and cost four hundred and twenty-five dollars, so it is not accessible to most people. Still, it is also helpful for people that will be visiting different areas of the country.

Conclusion

Extension and Industry both have their place in integrated pest management. The recommendations are similar in each instance; the only real difference is that Industry can specifically recommend products while Extension cannot. The information is not newer or more valuable in either they are both comparable. In terms of agronomist and entomologist information, the Winfield book would be more helpful if you have a large territory to manage. In contrast, the Purdue information is helpful if you are a producer in the Midwest. The useability is also more convenient because Purdue has a public app, whereas the Cooperative has an app, but it is private. The one piece of information that was lacking in both is that each insect is considered individually. So that insect must hit the threshold before a recommendation is made to apply chemicals. Still, it does not take other insects into account that should be explored for both institutions.