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Analysis of Disease in Plants Guava Demspter Shafer Method Using Web Based in the village of Paradise Sei Rampah

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ABSTRACT

Cashew water is known by the Latin name Syzgiumaqueum. According to experts there are two subgroups taxonomy guava, guava fruit is small that the average acid (Syzygium aqueum) and large fruit guava and sweet (Syzqium samarangense). In terms of cultivation, handling guava honey was not easy. During this time the problem occurred in the field is the lack of knowledge of the owner of the types of pests and plant diseases guava honey so frequent misdiagnosis resulted in delays in menagani plant pests and diseases. In analyzing or diagnosing diseases in plants guava honey, the author uses the method Dempster Shafer. With the expert system analysis of the disease can help owners in knowing the disease and how to handle them. Dempster Shafer is a mathematical theory of evidence based belief functions and plausible reasoning (function beliefs and thoughts that makes sense) are used to combine separate pieces of information to calculate the probability of an event. Testing applications using the programming language PHP and MySQL database

1. Introduction

Cashew water is known by the Latin name Syzgium aqueum. According to experts there are 2 subkelombok taxonomy rose water, which is Syzgium aqueum and Syzgium samarangense. Cashew nut honey is included in Syzgium samarangense. Guava is very popular because it is super sweet and fruit shape were quite large. Even guava varieties are classified as having the highest sweetness level in Indonesia. The size of trees that could be cut short too fits into the trimmer in the yard of the house is minimalist. Guava honey can be harvested 40-50 days after flower fruit is turned into small pieces. Paradise Village is a village in the District of Sei Rampah. In this village quite a lot of people who cultivate the plants guava honey for consumption and for resale. In terms of cultivation, handling guava honey was not easy. Can be sure every owner or farmer growing guava honey have met with resistance, Beru [a pest and diseases. During this time the problem occurred in the field is the lack of knowledge of the owner of the types of pests and plant diseases guava honey so frequent misdiagnosis result in a delay in dealing with plant pests and diseases. Based on previous research on different objects (Mugirahayu Handayani, Taufiq and Soegiarto, 2016) the application of SP and DS can help the community in terms of diagnosing plant diseases watermelon and address them early, then get information on how to control and treatment without having to wait for the clerk or go to Plant Protection and Food Hall Holtikultra (BPTPH) to ask it.

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2. Theory

2.1 Water apple

Indonesia is rich in varieties of guava either the local or introduction. The many types of guava can be distinguished by physical and color. Among the diverse species of superior plants are species that have a characteristic or feature of other plant species (I. Eny Pujiastuti, 2015: 6).

2.2 Expert system

According to Turban on the book Introduction to Expert Systems and Methods (2017) Expert System is a system that uses human knowledge where knowledge is inserted into a computer and then used to solve problems that require expertise or human expertise. Expert referred to here is an individual who has special knowledge, experience and methods used to solve problems in a particular field. Expert System is a program that combines artificial Intellegence knowledge base (Knowledge Base) with the inference system to mimic an expert.

2.3 Demspter Shafer

Shafer Demspter method is a mathematical theory of evidence based belief function and plausible reasoning (function beliefs and thoughts that makes sense) are used to combine separate pieces of information (evidence) to calculate the probability of an event

3. Results and Conclusions

There are many pests and diseases in plants guava honey each symptom has a value of density / weight. The weight values obtained from UPT Protection of Food Crops and Horticulture North Sumatra Province.

Research case examples:

Dempster Shafer step method to make diagnosis are as follows.

For example, symptoms seen in guava plants, the symptoms are:

a. Gradually fruit rot (G08)
b. The presence of small round whitish spots on the bottom surface of the leaf (G15)
c. There are spots on the fruit (G22)

First Step dalah determine density values for any disease symptoms

G08: (P02, P05) Fruit rot, Patek (Antraknosa) = 0.9
G15: (P04) Dew Flour (Powdery mildew) = 0.8
G22: (P05, P18, P21) Patek, aphids, fruit flies = 0.7

Since there are more than one symptom then the next step is to calculate the value of new density.

The first step is to determine the value of m1 and m2

m1 {P02, P05} = 0.9
m_1 {θ} = 1-0.9 = 0.1
m2 {P04} = 0.8
m_1 {θ} = 1-0.8 = 0.2

After the value of m1 and m2 is found then the next calculates a new density value m3

Table I
Density Values

		P04	0.8	0	0.2
P02, P05	0.9	P04	0.72	P02, P05	0:18
θ	0.1	P04	0:08	θ	0:02

Based on calculations it is found m3 values as follows:

m_3 {P04} = 0.72 + 0.08 / (1-0) = 0.8

m_3 {P02, P05} = 0.18 / (1-0) = 0.18
m_3 {θ} = 0.02 / (1-0) = 0.02

Selanjunya step is to calculate the new density value m3

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M_4 {P05, P18, P21} = 0.7
M_4 {θ} = 1- 0.7 = 0.3

Table II
Density Values

		P05, P18, P21	0.7	θ	0.3
P04	0.8	θ	0:56	P04	0:24
P02, P05	0:18	θ	0126	P02. P05	0054
θ	0:02	P05, P18, P21	0014	θ	0006

Based on calculations it is found m5 value as follows

m_5 {P05, P18, P21} = 0.014 / 1- (0.56 + 0.126) = 0.044
m_5 {P04} = 0.24 / 1- (0.56 + 0,126) = 0,764
m_5 {P02, P05} = 0054 / 1- (0.56 + 0.126) = 0171
m_5 {θ} = 0006 / 1- (0.56 + 0.126) = 0.019

The calculation is completed. Based on the final result it was found that the greatest density value is {P04}. Then the diagnosis of the first sample is Dew Meal (Powdery mildew) with a density value of 0764. In percentage becomes 76.4%.

4. Conclusion

Based on research conducted for this can be concluded, as follows:

a. Expert system Dempster Shafer method can treat the symptoms in diagnosing diseases of the guava.
b. With this application, farmers and owners can find out some things about the guava plant diseases suffered
c. This application is built web-based, using simple HTML and JavaScript PHP also to beautify the look, so the application can be easily accessed.

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