1. Introduction

Corn has strategic role in national food map and as a reliable commodity in accelerating food sufficiency. Corn is a plant which has wide adaptability and relatively easy to be cultivated. Therefore, corn may be planted on a range of agroecological types either dry land, paddy field, lowland, or even tidal land, on various land and climate types, on high land with altitude between 0-2,000 m above sea level [1]). Corn biomass as food and animal feed source reaches 10% of the total protein and calorie intake, meanwhile in national economy, corn is the second big contributor after rice in sub-sector of food plant[2] . Results of survey show how big household consumption is for corn based on fixed number in 2012, it reached 1.68 kg/capita/year. Based on the production in 2013, it decreased into 1.47 kg/capita/year, and re-increased to 1.56 kg/capita/year in 2014 [3]. These data indicates that corn has big role in fulfilling national needs for food and animal feed. In 2016, corn is [4] needed for domestic food resources and industrial raw material reached 13.8 million ton.

The main issue in corn farming is the high possibility to lose corn yield due to maize weevil *Sitophilus zeamais* Motsch (Coleoptera:Curculionidae) in warehouse[4–9] It is estimated that there are 17 insect families which potentially damage agricultural products in warehouse, represented by 1-3 insect types [10]800 thousands of insect species have been described and around 3 million species are unknown [11] . From many warehouse pests, [12] suggested that *S. zeamais* Motsch is the most destroying pests. This pest ability to damage yield occurs on active larva stage, since larva bores and attacks seeds and then hide inside it [13]. This pest are mostly found in tropical or sub-tropical regions [14-15]. This pest is polyphagous since it can attack several plant products in warehouse of food stock such as corn, sorghum,
rice, wheat [16–18], and processed food products, among other pasta and biscuit. Nonetheless, in corn plants, this pest can attack corncob since it is still in crop, especially on those which have imperfect husk cover [19]

[20] and [21] explained that this pest ability is in between 26-29% or even beyond 30% on commodity of storage yields [22], in South Sulawesi damage score that has been recorded is until 85% with ability to shrink the material until 17% [23]. If water content is relatively high around 18-20%, this pest attack may cause damage of 30-40% [24-25] and weight loss of 12.65-21.54%. Yet, if this pest attack occurs together with other warehouse pests, the loss incurred becomes lower, in which 24.5% [25-26]. Besides damage directly, this pest attack may decrease product quality, nutrition, seed weight, germination percentage, which eventually decrease market value [27–29]. The data showed that at the time of harvest, drying, sorting, transportation, and storage, the loss number of yield is up to 20%. Yield loss from each stage is different based on region and production system. Nevertheless, storage stage is the critical stage, and this pest is the main pest which causes serious issue in storage period since it may decrease yield quality and quantity drastically [30] in rice commodity the loss percentage is quite small [30-31]. Due to those reasons, this research investigate any factor that attract the maize weevil to the food source. The factor were the variety and the light source needed that affect the maize weevil ability.

2. Material And Method
This research was conducted in laboratory of pests and plant disease Maros Cereals Research Institute 2021. This research used complete random design with 3 repetitions. There were 6 varieties put into small glass and placed in circle within big jar and then it invested 100 heterogenous adult maize weevils in each jar. As a control, an empty glass put in the center of glasses circle within the jar. It was conducted observation and calculation on living and dead maize weevils on each glass and outside glass with intervals of 24, 48 and 72 after maize weevils’ investment. This research was performed in the light and dark places. The insect percentages which live and dead were: % Live insect was divided by 100 minus insect which was found outside the variety glass (live and dead) multiplied by 100%. It also applied for dead insect, thus dead insect percentage was divided 100 minus insect found outside the variety glass (live and dead) multiplied by 100%. Variance testing uses Analysis of Variance with analysis of significance test uses Tukeys's Honest Significant Difference (HSD) Test.

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\% \text{ survivorship} = \frac{\text{alive insect}}{\text{total insect}} \times 100\%
\]

\[
\% \text{ mortality} = \frac{\text{dead insect}}{\text{total insect}} \times 100\%
\]

3. Results And Discussion
3.1 Result
On 24 hours interval observation of dark phase, it is found that percentage of live insect on each variety is around between 024.12%-34.02% and on control glass there is no live insect. Analysis result of variance shows that insect ability to find food on the dark phase with variety difference is not apparent (Figure 1).

On 48 hours interval observation of dark phase, it found that live insect percentage is around between 13.08-27.06% and in control glass it is found 2% live insect. It also happened on the test variety glass that showed no dead insect. Variance analysis result on 24 hours interval after insect investment showed that in the dark there was no apparent differences between respective varieties with insect ability to find food (Figure 1).
Figure 1. Diagram of live insect percentage on each variety and time treatment in the dark place. Different letters show significant differences from each treatment. Significance test uses Tukey’s Honest Significant Difference (HSD) Test.

On 72 hours interval observation of dark phase, it was found that live insect percentage was around 7.85-24.12% and in control glass it was found 0.84% live insect. Variance analysis result on 72 hours interval after investment showed there were significant differences between varieties in which Sukmaraga variety (24.12%) invested with pest *S. zeamais* higher than other varieties (Figure 1).

On 24 hours interval observation of light phase, it was found that live insect percentage was around 5.58-25.33% and in control glass it was found 0.43% live insect. Variance analysis result on 24 hours interval after investment showed that there were significant differences between varieties in which Provit A variety (25.33%) invested with pest *S. zeamais* higher than other varieties (Figure 2).
Figure 2. Diagram of live insect percentage on each variety and time treatment in the light place. Different letters show significant differences from each treatment. Significance test uses Tukey’s Honest Significant Difference (HSD) Test.

On 48 hours of interval observation of light phase, it was found that live insect percentage was around 8.44-21.67% and in control glass it was found 0.38% of live insects. Variance analysis on 24 hours interval after investment shows there were significant differences between varieties in which Sukmaraga variety (21.67%) invested with pest *S. zeamais* higher than other varieties (Figure 2).

3.2 Discussion

Based on the observation and statistical analysis performed in the dark and light places, there were significance difference of insect percentage which to choose the corn variety on 24 and 48 hours of observation in the light and treatment with 72 hours in the dark. Varieties of Sukmaraga and Provit A became the priority of *S. zeamais* as food source. There was preference of *S. zeamais* pest in finding food sources. It was possibly caused by the morphological difference of each corn variety. Hasanuzzaman A, Islam M, Zhang Y, et al (2016) investigated the influence of leave morphology (length and density of trichome, leave thickness, as well as leave collar wavelength) on the preference of Whitefly *Bemisia tabaci* (Hemiptera: Aleyrodidae) on various eggplants [32]. Maize weevil showed the preferences to certain variety. Sukmaraga and Provit A varieties have different color with other varieties [33–38]. Further research shall be performed to observe other factors which influence preference of *S. zeamais* in host.

Observation of dark and light also becomes the things which need to be concerned in this research. Based on the result of research, it showed that there are no differences between treatment of light and dark. This is possible because in choosing food sources, pest *S. zeamais* is not influenced by light source, but influenced by food sources existence since volatile compound comes from food resources. Insect attractiveness to other host plants and microorganisms involve specific semiochemistry detection with specific ratio [39,40]. Cereal which shelled naturally releases substances which easily evaporate after it is shelled or split artificially. Kernel separation influence the treatment of *S. oryzae* with different method. Substances released from kernel parts acting independently each other [41]. Besides, there are chemistry substance which are able to make adult maize weevil dead by using several oil from plant extraction (vegetable oil). Result shows that vegetable oil from lemon is able to indicate until LD 50
reaches 50%. Nevertheless, it is need to be concerned that vegetable oil use as one of the component in PHT program which is able to decrease synthetic chemical [42].

Determination on food sources must obtain more attention. Based on the result found that each variety was not significant difference. Based on the previous research, it was found that the most critical factor which influenced corn vulnerability as food resource of maize weevil was the hardiness level of seed. Therefore, research on corn seed hardness level on attack vulnerability need to conduct further research.

4. Conclusion
Light source not affected the ability of maize weevil to find the host. This research found that the varieties affect the preference level of maize weevil. The research about varieties must be conduct to understand the preferences factor.

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