INTRODUCTION
Climate is a very important factor in agriculture. It sets the limit for the agricultural activity in many agroecologies. Temperature, rainfall, humidity, photo-period and altitude are major components of climate which interact to produce the local weather. Adverse effects of climate change continue to be a major threat to rural livelihoods. Global warming, food poising and environmental pollution are current challenges as a result of excessive exposure to and combustion of chemical substances.

Climate change also plays a major role in altering the development of cocoa pests and pathogens and shifting their interactions, which implies reduction in crop yields and out yields and negative impact on income and livelihoods of farmers.

Climate change imposes constraints to development especially among smallholder farmers whose livelihoods mostly depend on rain-fed agriculture. Cocoa black pod disease is one of the major diseases affecting the cocoa production in Nigeria and other producing countries.

Black pod disease accounts for quite a lot of cocoa production losses by attacking the ripened or young pods and the disease is closely related to rainfall distribution pattern. It is more prevalent in damp situations with highest pod infection in years when the dry period is from July to August’s very wet.

The climate variable influenced the cocoa black pod disease incidence and it is important to quantify the black pod disease variation due to the effect of climate variables.

Climate change can also alter the development of pests and diseases and modify the host’s resistance and more importantly, the black pod disease is a major threat to cocoa production when the relative humidity is very high.

OBJECTIVE
This paper presents preliminary investigation of affect of climate variables on the cocoa black pod disease incidence in selected growing ecologies of Nigeria.

MATERIALS AND METHODS
Mature and optimally bearing cocoa plots were selected at Ogbianbali on Lat. 7.21'6N, Long. 3.85'20E, Oyo State, Nigeria for the field trials.

Copper-1-oxide 60% + metalaxyl 12% WP – based fungicide
Spray pumps
Evaluation of the effect of climate change on Phytophthora pod rot incidence on cocoa during the fruiting season of 2014, 2015 and 2016 was done.

The copper-1-oxide 60% + metalaxyl 12% WP – based fungicide was applied to control Phytophthora pod rot disease on cocoa between May and October each year.

The selected cocoa plots were subjected to three spray application strategies: Alternate monthly spray, monthly-spray and no spray application.

RESULTS
Record of observation of the black pod incidence on cocoa trees were taken and information on incidence of Phytophthora pod rot, weather parameters in the study location were subjected to correlation and regression analysis to determine the effect of weather condition on black pod disease and management technique.

Table 1: Regression and ANOVA summary output (2014)

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<td>Standard Error</td>
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<td>Observations</td>
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<table>
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<th>df</th>
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Positive correlation was recorded between black pod incidence and relative humidity with exception of 2016.

Negative correlation in black pod incidence and temperature also except in 2016 season and negative relationship between black pod disease and rainfall in the selected years.

The effect of climate change was evident in both in temporal and spatial distribution of pod rot incidence in cocoa production, the weather parameters and black pod disease incidence indicates strong relationship and high R2 square value and significantly affect the black pod incidence in cocoa season in the trial location.

A model is required to be developed in Nigeria, which could be used to forecast black pod incidence to assist farmers determine timely application of fungicide and cultural practices to control black pod disease in cocoa growing ecologies.

CONCLUSION

The weather pattern for Oyo among other Southwest states showed that height of rainfall was between the months of March and October from 1991 to 1995.

This suggests the possibility of black pod infection within these periods and that Phytophthora megakarya thrives better between 20°C and 30°C, therefore the specific period of the year that favours such temperature values in Oyo state includes were June, July, August, and September.

The effect of weather condition on black pod disease infestation was carried out in this study between May and October in adoption of the recommendation on period of black pod disease infection.

Significant effect and differences were recorded in the weather variable and the incidence of black pod disease in study location.

The positive correlation parameters on the expression of black pod disease on cocoa were evaluated and the parameters evaluated varied significantly from the first to the third year of assessment.

The findings in this study reveal the initial belief by farmers that rainfall bring about increase in black pod disease.

The temperature increase is not the cause of high black pod disease incidence but the high humidity usually in the morning among other contributing factors.

REFERENCES


