Cloud Publications
International Journal of Advanced Agricultural Sciences and Technology
2015, Volume 4, Issue 1, pp. 72-78, Article ID Sci-266
ISSN: 2320 – 026X

Research Article | Open Access

Developing an Informative Agricultural Crop Related Software

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Publication Date: 30 March 2015

Article Link: http://scientific.cloud-journals.com/index.php/IJAAST/article/view/Sci-266

Abstract The paper propose the development of an interactive, flexible and user-friendly software for getting information about the amount of fertilizer, insecticide and medicines for some agricultural crops in Visual Studio 2008 environment and evaluation. From the software user will get the detail amount fertilizer needed for his particular cultivated area along with the information about the insecticide and medicine need for resisting the insect or disease that harm the crop. The software is made in regional language (Bengali) so that every common people of this region can understand the language. The information regarding to the software are valid only in the soil condition of West Bengal, India.
Keywords *Fertilizer; Software; Agricultural Crops; Pest; Crop Disease; Visual Studio*

1. Introduction

Fertilizer is a material that originate naturally or synthetically and which is applied to the soil or plant tissue for the essential growth of the plants [1]. According to conservative estimates report 30-50% of the crop yields are attributed to natural or synthetic commercial fertilizer [2]. There are three macronutrients of fertilizer. They are nitrogen (N), potassium (K) and phosphorus (P) [1]. The classification of nutrients essential for the healthy plants is based on the elements but the elements are not used as fertilizer. The macronutrients are consumed in larger quantities and are present in plant tissue in quantities from 0.15% to 6.0%in a dry matter basis [2].

Particular Insects and pests attack the particular crops depending on the seasons. They harm the crop and sometimes this becomes the most effective cause of the loss of desired yield of that particular crop. So, to protect the crop from these insects, insecticides are used in fields. These are mainly chemicals that are available in market in different forms, like powdery, liquid, soluble powder, insoluble powder etc. [2]. These fertilizers should be applied to crop in proper time.

Same as Insects some diseases cause harm to crops and take part in reduction of yield of that crop. So, some safety precautions are taken to reduce the chance of occurring the disease to the particular

crop. Chemicals are available in the market in various forms. Proper application and application in time in the field of the particular crop enhance the yield.

2. Method for Calculating the Amount of Fertilizer Needed

Let the amount of nitrogen, phosphorus and potassium needed to any particular crop is N, P, K

Assume the fertilizer that will be given contains x% Nitrogen, y% Phosphorus

Let N>P>K so requirement of nitrogen to that fertilizer is high

100 gm of that fertilizer contains y gm of phosphorus

To give the total amount of phosphorus the amount of fertilizer needed = {(100*P)/y} = A

Now as the fertilizer contains nitrogen compound also, so, the amount of nitrogen that we will get from the complex fertilizer = {(A*x)/100} = N'

Now the amount of Nitrogen needed = (N-N')

This amount of Nitrogen should be given to the field by using a single fertilizer that contains Nitrogen compound

Let the single fertilizer be Urea that contains 46% Nitrogen

So the amount of Urea needed to overcome the Nitrogen deficiency is = [{100*(N-N')}/46] and to overcome the Potassium deficiency let use MOP that contains 16% of Potassium

So the amount of MOP needed = {(100*K)/16}

3. Software Development

In this software all the information and data are in-built. The users only have to input the amount of area on the time of calculating the amount of fertilizer needed for the particular crop for the particular area. It is very user-friendly and updated.

4. Layout

The user will first face a form that contains the categories of field i.e. i. Fertilizer; ii. Insect; iii. Disease. User can select any of the categories and it will redirect the user to next form according to the selected category. The language that user will face is Bengali.

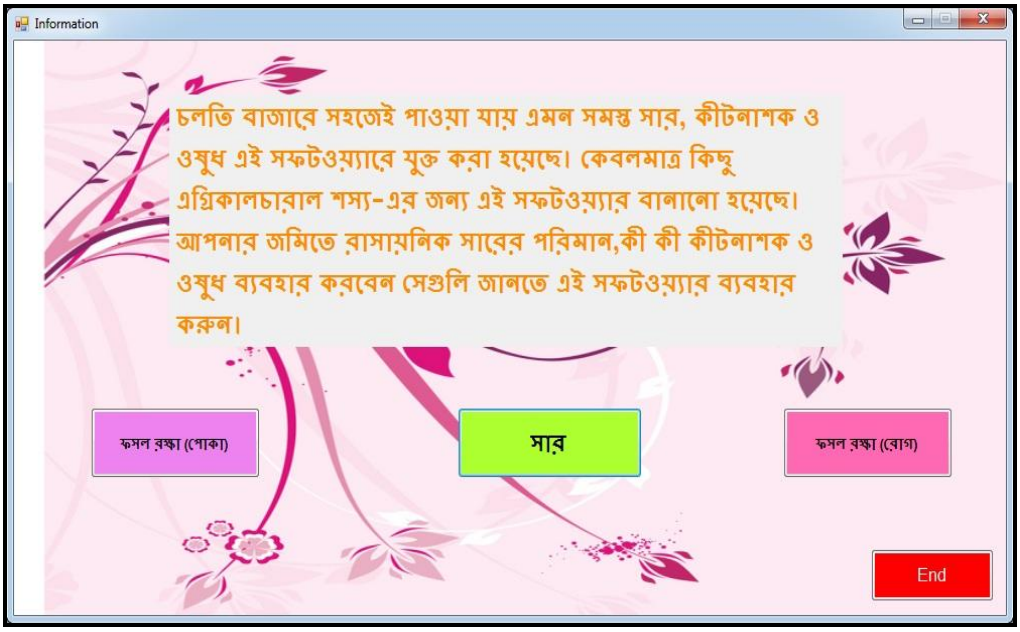


Figure 1: *Selection of Category*

Then if the user select fertilizer it will redirect to the categories of soil form and after selecting the soil category it will directly redirect the user to the crop form. Here user will get many types of crops and accordingly user can select one at a time.

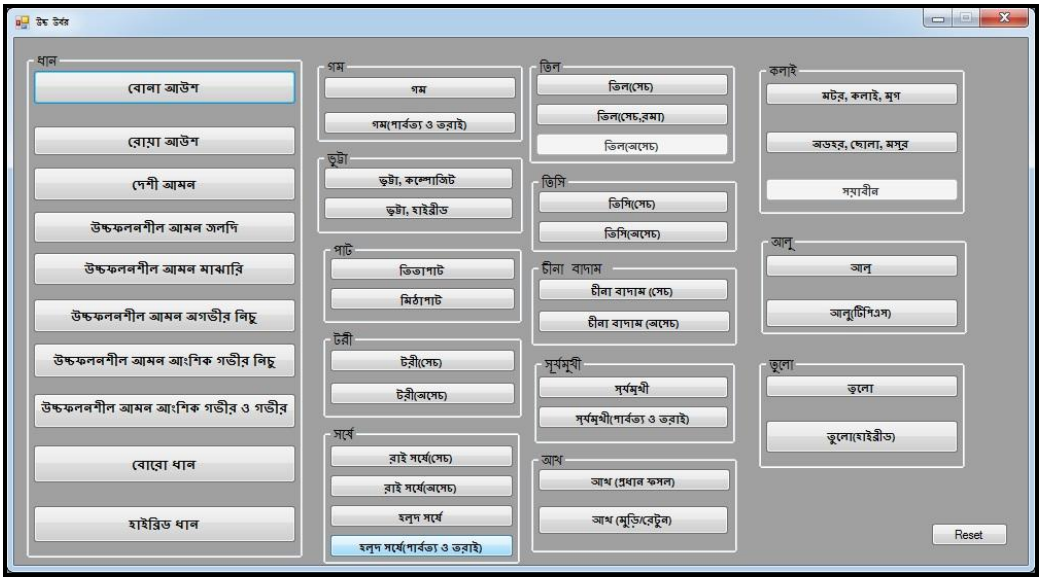


Figure 2: *Selection of Crop*

Then it will ask the user to enter the amount of area in which crop will be practiced.

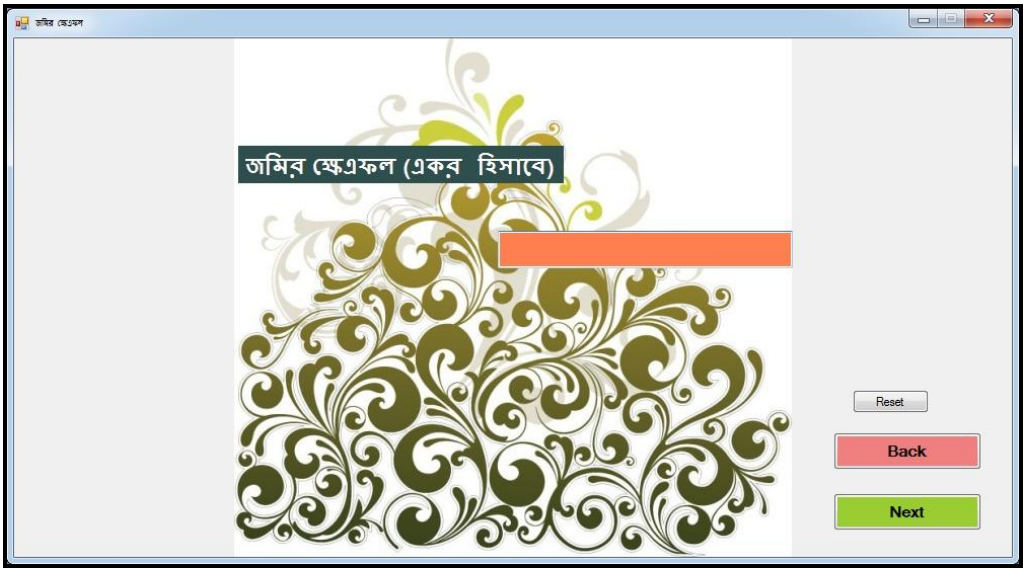


Figure 3: *Input of Area of Cultivation by User*

Then the user will redirect to the fertilizer form where available fertilizers are given as set format. User can choose any one set at a time. The available fertilizers are highlighted in green color.

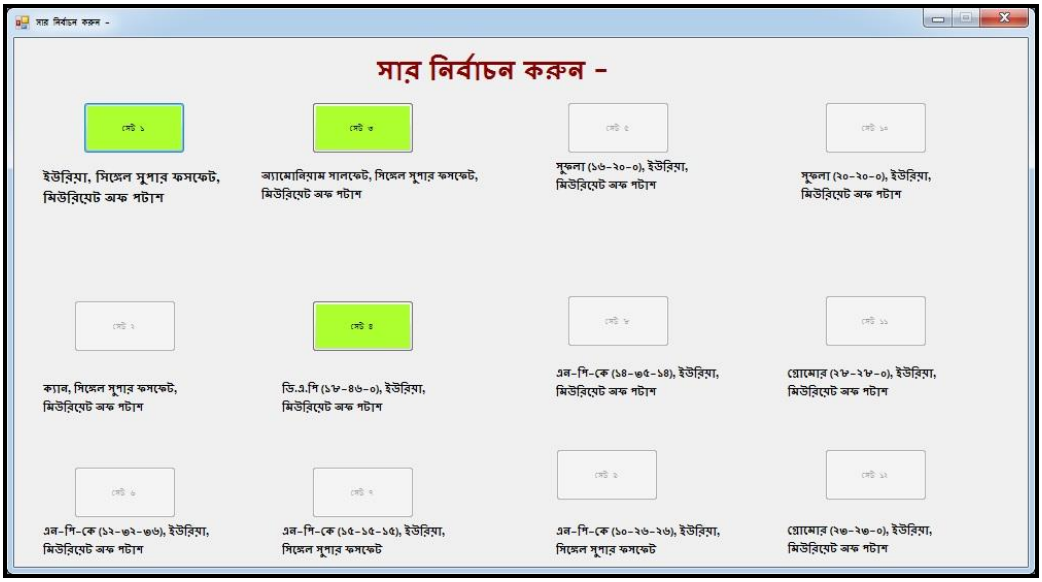


Figure 4: *Selection of Fertilizer*

Thereafter it will redirect the user to the final result form, where user will get the result after clicking the button. Here, user can close the software or can go the insect or disease form according to desire.

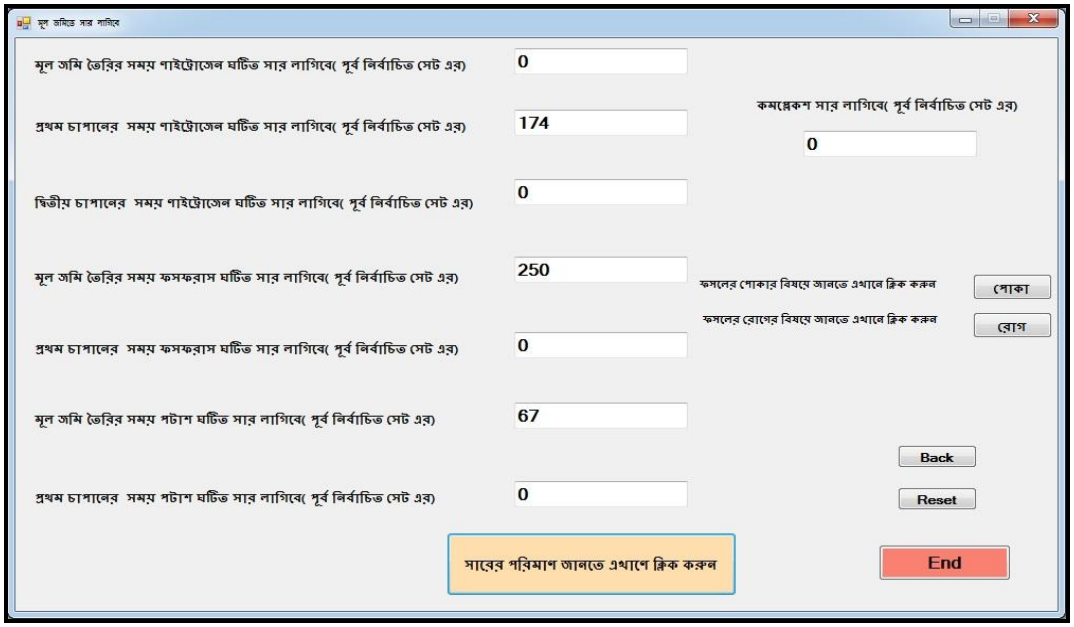


Figure 5: *Result*

If the user select insect or disease at the beginning of this process or after getting result of the amount of fertilizer it will redirect to another form that contains crops and the common insects that generally attack the particular crops. Here, at first users have to select the crop and then users have to select the particular insect.

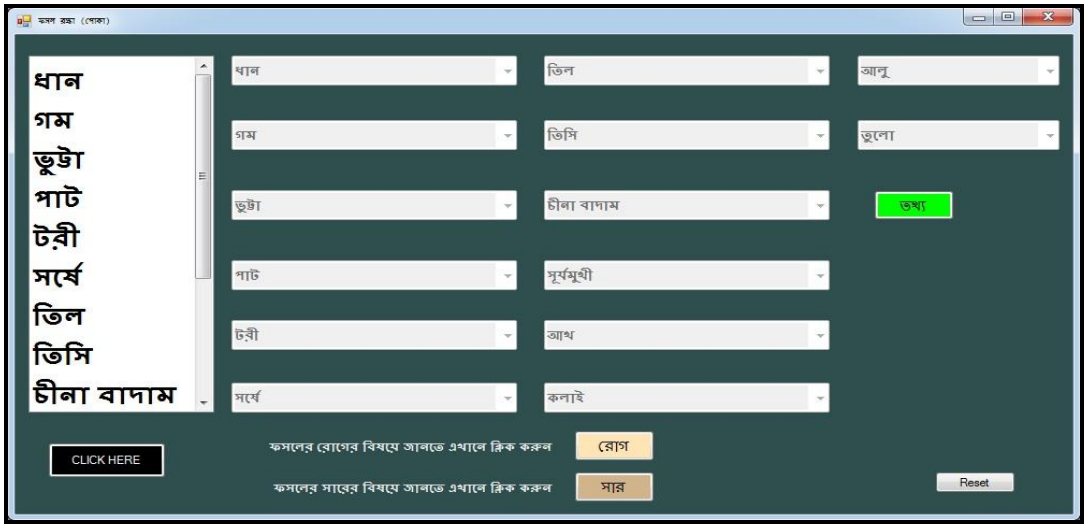


Figure 6: *Selection of Crop and Insect*

Then it will redirect user to final information form.

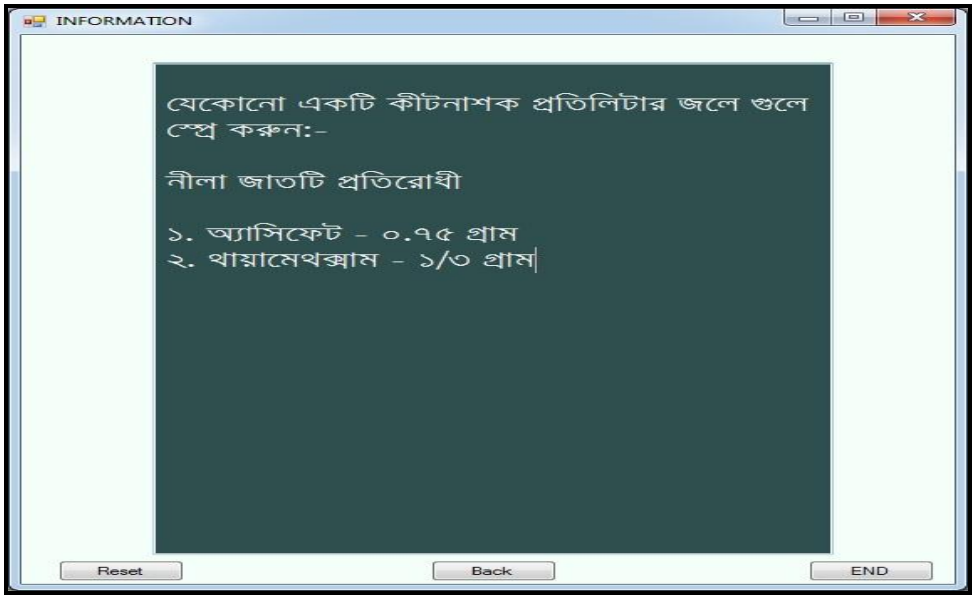
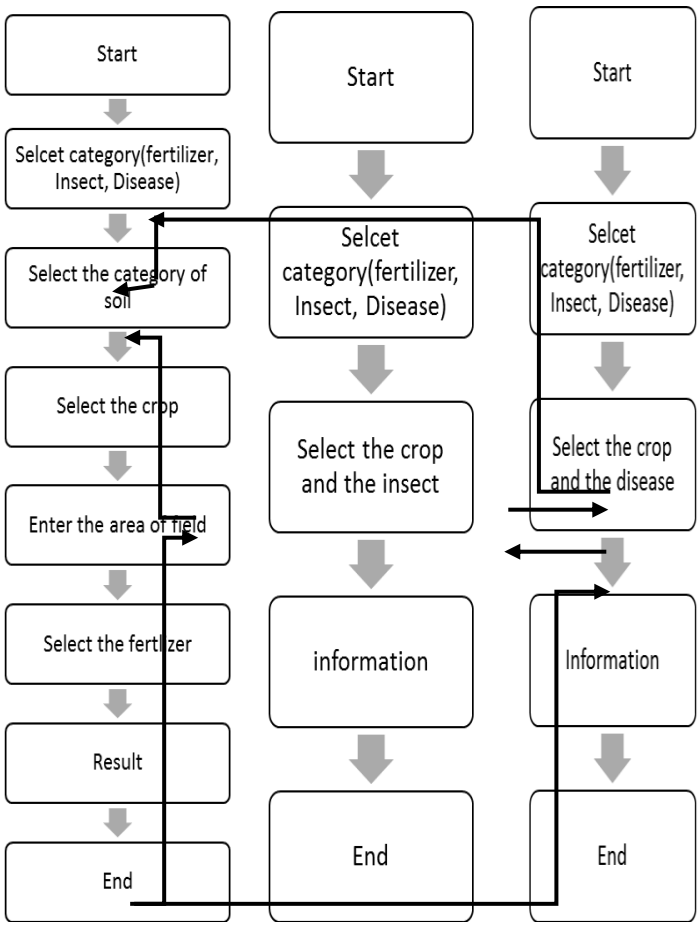


Figure 7: *Information*

In case of disease it is same as the insect. Only thing is that user will get diseases instead of insects in this particular form.

5. Algorithm for the Software



a) Fertilizer *b) Insects* *c) Disease*

6. Conclusion

At earlier time people did those calculations manually and it took much time to evaluate the result. But by using this software anyone can evaluate the result within a short time. To use this software the user need not to know much thing. User will only input the amount of field area and other things will be selected at selection procedure. The main thing is that this software is developed is regional language which will help all types of people of this region to understand. The information is also in regional language (Bengali), so any person who does not know other languages will understand the information easily. All the information regarding to this software are valid only to soil condition of West Bengal, India.

References

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