

# Growth Analysis of Plant by Using Computer C Language Program

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**Abstract** – For the maximum growth of crops, the scrutiny of growth and development in scheming methods is necessary. It is necessary to increase the yield of crops. This paper introduces that how can measure the growth analysis of a plant by using C language. Blackman (1919) introduced the growth of plant by an efficiency index of relative growth rate. Monsi and Saeki led to endeavor in rice breeder in the japan for developing more pervasive definition of better plant type and create model of crop photosynthesis. The research deals with the Growth Analysis of plant. The process includes some formulae for analyze the growth of plant by using C language.

**Index Terms** – Growth Analysis, C Language, Photosynthesis.

## 1. INTRODUCTION

For the maximum growth of crops, the scrutiny of growth and development in scheming methods is necessary. It is the analysis which will be based on repercussion with different factors environment. It will help to improve the yield of crops. It is works by innovate the environment factors. These all factors help to achieve best development of crop. This technique contains approximate growth element and harvesting or yield elements. The technique helps for recognize and define the plant type which is preferred. This will be recognize high income factors.

## 2. MATERIALS AND METHOD

The research deals with the Growth Analysis of plant. The process includes some formulae for analyze the growth of plant by using C language. It will be calculated by using this software which made by C language.

### ❖ System Configuration

Desktop System                      Intel® Pentium® 4, 2.0 GHz  
   1 GB DDR 2-RAM                      Intel 845 Series Motherboard  
NvidiaGeforce 4® –440-8x AGP card  
Microsoft®Windows™ XP Professional Version 2002 Service Pack 2                      Windows Development  
Microsoft® Access 2000(9.0.2720)

### ❖ Preferred Platform

For the development of software for Growth Analysis using C language Version 3.0 Turbo c++ copyright (c)1990, 1992 by Borland International, Inc. following different formulae are used.

### ❖ Growth analysis

LAI is use as common parameter in growth analysis, crop growth rate, relative growth rate, net assimilation rate and leaf area duration.



Fig: Growth Analysis

### ➤ Leaf Area Index (LAI)

Leaf Area Index is necessary in photosynthesis process. Leaf Area Index is measured by following formulae:

$$LAI = \frac{\text{Leaf Area}}{\text{Ground Area}}$$

### ➤ Absolute Growth Rate (AGR)

Absolute Growth Rate (AGR) calculates the rate of growing of crop (i.e It is growing fast or normal rate. Following formula is used to calculate Absolute Growth Rate (AGR). In the following formula W(w1, w2) is used for dry weights of plants at time T(t1, t2)

$$AGR = \frac{W2 - W1}{t2 - t1}$$

### ➤ Crop Growth Rate (CGR)

It is growth rate of crop per unit area and introduced as g/m<sup>2</sup>/day.

$$CGR = \frac{1}{P} * \frac{W2 - W1}{t2 - t1}$$

➤ **Relative Growth rate (RGR)**

In the following formula  $W(w1, w2)$  is used for dry matter of plants at time  $T(t1, t2)$

$$RGR = \frac{\log W2 - \log W1}{t2 - t1}$$

➤ **Net assimilation Rate (NAR)**

It indirectly indicates the rate of photosynthesis. In the following formula L1, L2 is leaf area and W1, W2 is dry weight of plants at time t1, and t2.

$$NAR = \frac{(W2 - W1) * (\log L2 - \log L1)}{(t2 - t1) * (L2 - L1)}$$

### 3. SOURCE CODE

```
#include <stdio.h>
#include<math.h>
#include<conio.h>

void main()
{
    float LAI ;      /* Leaf Area Index */
    float W2,W1;     /* dry weights of plant*/
    float LA,GA,P ;  /* for Area */
    float AGR ;      /* Absolute Growth rate */
    float CGR;       /* Crop Growth rate */
    float t2,t1;     /* This parameter for time */
    float RGR;       /* Relative Growth Rate */
    float NAR;       /* Net assimilation Rate */
    float L1,L2;     /* leaf area */
    float LAD;       /* Leaf Area Duration */
    float LPR;       /* Leaf Production Rate*/
    float Pl1, Pl2;  /* Length of emerged panicle */
    float FR;        /* Rate of Flowering*/
    float Fr1,Fr2;   /* Number of flowers*/

    int kk, choice =0 ;

    clrscr();

    // while statement start
        while (choice!=10)
        {
            clrscr();
```

```
// setcolor(10); //
printf("\n\t\t\t\t\t**** DEPARTMENT OF AGRONOMY****\n");
printf("\t\t\t\t\t~~~~~\n");
printf("\tGROWTH ANALYSIS");
printf("\tAnalysis of Growth, Development and Yield\n");

printf("\t\t 1.Leaf Area Index(LAR)\n");
printf("\t\t 2.Absolute Growth Rate(AGR) \n");
printf("\t\t 3.Crop Growth Rate(CGR)\n");
printf("\t\t 4.Relative Growth Rate(RGR)\n");
printf("\t\t 5.Net Assimilation Rate (NAR)\n");
printf("\t\t 6.Leaf Area Duration(LAD)\n");
printf("\t\t 7.Leaf Production Rate(LPR)\n");
printf("\t\t 9.Rate of Flowering(FR)\n");
printf("\t\t 10.EXIT \n");
printf("\n\t ENTER YOUR CHOICE <1 -10>");
scanf("%d",&choice);

switch (choice) /* choice an option */
{
case 1: /* for Leaf Area Index*/
{
clrscr();

printf("\n\t\t **** 1.Leaf Area Index ***\n ");
printf("\n\t\t Input value for Leaf Area Index==>\n");
printf("\n\t\t Enter the value for Leaf Area\LA=");
scanf("%f",&LA);

printf("\t\t Enter value of Ground Area \GA=");
scanf("%f",&GA);

LAI=LA/GA;

printf("Leaf Area Index =%.2f",LAI);
/*For print press key*/

getch();
break;
}
}
```

```

case 2 :          /* For Absolute Growth Rate*/
{
clrscr();

printf("\n\t\t **** 2.Absolute Growth Rate ****\n\t ");
printf("\n\t\t Input value for Absolute growth
Rate(AGR)==>\n");

printf("\n\t\t Enter the value for dry weight of plants
at time t2(g)\W2=");
scanf("%f",&W2);

printf("\n\t\t Enter the value for dry weight of plants
at time t1(g)\W1=");
scanf("%f",&W1);

printf("\n\t\t Enter the value for time t2=");
scanf("%f",&t2);

printf("\n\t\t Enter the value for time t1\W2=");
scanf("%f",&t1);

AGR=(W2-W1)/(t2-t1);
printf("\n\t\t Absolute Growth Rate=",AGR);
getch();
break;
}

case 9 :          /* For Rate of Flowering */
{
clrscr();

printf("\n\t\t **** 9.Rate of Flowering ****\n\t ");
printf("\n\t\t Input value for Rateof
Flowering(FR)==>\n");

printf("\n\t\t Enter the value for time t2=");
scanf("%f",&t2);

printf("\n\t\t Enter the value for time t1=");
scanf("%f",&t1);

printf("\n\t\t Enter the value for Number of flowers at
time t1\Fr1=");
scanf("%f",&Fr1);

printf("\n\t\t Enter the value for Number of flowers at
time t2=Fr2=");
scanf("%f",&Fr2);

```

```

FR=(Fr1-Fr2)/(t2-t1);
printf("\n\t\t Rate of Flowering=",FR);
getch();
break;
}

// end of case 10
} // end of all cases
} // main switch statement ends

```

// end of 1 start and end brace bracket

#### 4. RESULT AND DISCUSSION

In the research paper it is expressed that the guidelines and all for measure the physical properties of soil. The above software is created in the C language Version 3.0 Turbo C++.

##### How to use the Software:

1. Enter the option from 1 to 16 for which you want to measure the property.
2. Give the input values.
3. After pressing enter key, output will be displayed.
4. Again press the enter key to switch over to the main page.
5. Follow the same procedure to measure the soil properties those are included on the main page.

The program is compile for representative values of inputs for all 10 structures. Results obtained are as follows:



Fig: Main page: Option window

```

**** 1.Leaf Area Index ***

Input value for Leaf Area Index==>

Enter the value for Leaf Area LA=500.5
Enter value of Ground Area GA=800
Leaf Area Index = 0.63_

```

Fig: Program output for Leaf Area Index

```

**** 9.Rate of Flowering ***

Input value for Rate of Flowering(FR)==>

Enter the value for time t2=60
Enter the value for time t1=30
Enter the value for Number of flowers at time t1Fr1=40
Enter the value for Number of flowers at time t2=Fr2=70
Rate of Flowering= 1.33_

```

Fig : Rate of flowering

## 5. SUMMERY AND CONCLUSION

### Summary

This research is deals with measurement of Growth Rate. It consists the software to measure that Growth rate. These all processes are regarding the photosynthesis process in plants.

This is designed to easily measure the Growth analysis of the plants. The different properties are discussed i.e. Leaf Area Index, Crop growth factor, Leaf production rate ,Rate of flowering etc. The software was developed for Growth Analysis using C language Version 3.0 Turbo c+ copyright (c)1990, 1992 by Borland International was developed.

### Conclusions

1. System is platform independent.
2. This is to measure the Growth analysis .
3. Software is user friendly.
4. By using such software it can measures the preferred and appropriate value of the given element.

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