1) Soil only (control).
2) Soil with rice straw.
3) Soil with NPK fertilizer (18-18-0
4) Soil sprayed by *T.h.t.* (Suspension).
5) Soil sprayed by *T.h.a.* (Suspension).
6) Soil with rice straw treated by *T.h.t.*
7) Soil with rice straw treated by *T.h.a.*

## 3. Result and Discussion

The results in table (1) appears that the surface layer texture of the studied soil was Silty – Clay – Loam, the values of reaction degree (pH) for samples was 7.71, while the value of electrical conductivity (ECe) was 2.3 $dSm.m^{-1}$ , so this salinity values were a suitable due to the proper washing operations and agricultural rotations which used in this region [33] .

### 3.1 Fungi species and the frequency of isolated fungi

The results of the isolation and identification of fungi from the wheat rhizospher zone before and after the cultivations appear existence of 10 species of the fungi, whereas fungus *Aspergillus niger* was the most frequency of those species before, cultivation, which reached 28.31%, figure, (1- a) , while *Trichoderma. harzianum* was surpassed at the end of the season as frequency percentage reached 43.20 % figure (1- b),the reason was due to their high competition range with other fungi, through suitable bio-control mechanisms such as secretion of antibiotic and enzymes [34]–[35] , this results had coincided with the previous studies which have been isolated a number of fungi from soils cultivated with economic plants [36 ]–[37], the results were indicated to the domination of the biological control fungi at the end of the season and their ability to eliminate pathogens that their frequency ratio were decreased clearly, which may contributed to improvement the growth and productivity of wheat crop.

### 3.2 Total Nitrogen

The results in the figure (2-a) shown that the two treatments, soil with rice straw that treated by *T.h.t* and soil with *T.h.t.*(suspension) gave a significant increasing in the proportion of the total nitrogen in the leaves of wheat which reached 2.652,2.619 %,respectively, in compared with control treatment (soil only),which amounted to 2.450 %,this was consistent with what indicated by [38] about the role of the mass of microbial organisms in the analysis of organic matter, which in turn increases the content of this soil with mineral nitrogen ,also this is noted by [39] that treated the rice straw with *T.harzianum* fungus was contributed in increase the nutritional value of the straw. As well as, *T.harzianum* have a role in improving the efficiency of nitrogen absorption by plant roots [40].

### 3.3 Chlorophyll a & b Contents

The results in the figure (2-b,c) shown that the treatment of rice straw with biocontrol fungi *T.h.t* led to achieve a significant difference in the of chlorophyll a & b content (mg $.gm^{-1}$) of fresh weight of wheat leaves for a following treatments: soil with rice straw that treated by *T.h.t* and soil with *T.h.t.* (suspension),which reached 3.320, 3.271(mg $.gm^{-1}$) of chlorophyll a and 1.303,1.284 (mg $.gm^{-1}$) of chlorophyll b respectively, in compared with control treatment (soil only) which amounted to 2.911, 1.110 mg $.gm^{-1}$ of chlorophyll a, b of fresh weight respectively, this is consistent with [41] as they found that the increasing of chlorophyll correlate significantly and positively with the addition of nitrogen , also[42]–[43] that the increasing of cereal crops content of chlorophyll depends on nitrogen supplying for plant and its availability extent in in the soil solution

### 3.4 Plant Height

The results indicate that the addition of isolates *T.h.t* had given a significant increase in the height of the plants (cm), for the two treatments: Soil with rice straw treated by *T.h.t.* and soil sprayed by *T.h.t.* (Suspension) which stood at 110.85, 109.71cm,respectively, in compared with the control treatment (soil only),which amounted to 107.09 cm figure (3-a), the cultivation of cereals with residues increase the effectiveness of micro organisms and thus obtain a significant increase in plant height[44]

### 3.5 Weight of 1000- Grain

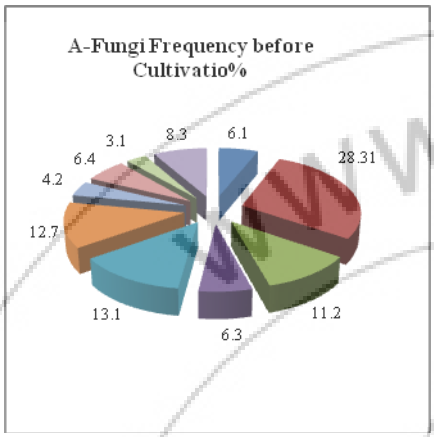
The results in figure(3-b) they were shown that the local isolate *T.h.t.* led to significant increase in 1000-grain weight, especially treatments which carried the fungus on the rice straw and *T.h.t.*(Suspension) sprayed on soil, which amounted to 33.012,32.851gm,in compared with the control treatment(soil only),which reached to 32.250gm,this explains the role of fungi in secreting of growth regulators, as pointed out that the positive impact of some isolates of *T. harzianum* in stimulating the growth of plants [45],because secretes the botanical growth regulators corresponding with other mechanisms, including the increasing of availability the absorption of plant nutrients, as well as indicated to the increasing in the rates of growth of sorghum plants which inoculated with *T.harzianum.* Also, the increasing of height of the plant affected significantly in 1000-grain weight and reducing the percentage of unfilled grains, this is consistent with [46], that indicates to the use of *T.harzianum* isolates gave a significant increasing in the weight of potato tubers

### 3.6 Yield Weight

The results indicate that the addition of isolate of *T.h.t.* and its suspension had given a significant differences in the wheat yield ($t.h^{-1}$), especially the two treatments: Soil with rice straw that treated by *T.h.t.*and soil sprayed by *T.h.t* .(Suspension),which reached 6.710,6.534$t.h^{-1}$,in compared with the control treatment (soil only),which amounted to 6.140$t.h^{-1}$.This may be due to the role of growth promoting fungi in stimulating the secretion of hormones and increase the ability of antagonisim against pathogen fungi as well as its role in improving the soil structure, which reflected positively in moisture retention and provide optimized water for plant growth[47]–[48] .

**Table (1)**:- Physical and Chemical Properties of Studied Soil for Agriculture season 2013

| Property | Quantity | The unit of measurement |
|---|---|---|
| PH | 7.71 | - |
| EC | 2.3 | $dS.m^{-1}$ |
| Sand | 120 | $gm.Kg^{-1}$ |
| Silt | 580 | $gm.Kg^{-1}$ |
| Clay | 300 | $gm.Kg^{-1}$ |
| Texture | -Loam Silty- Clay | |



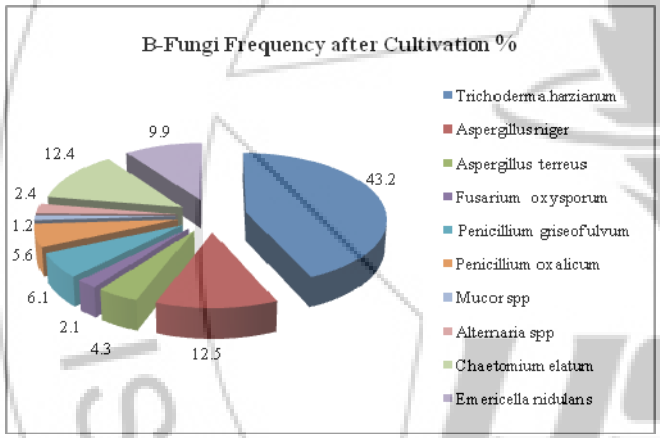
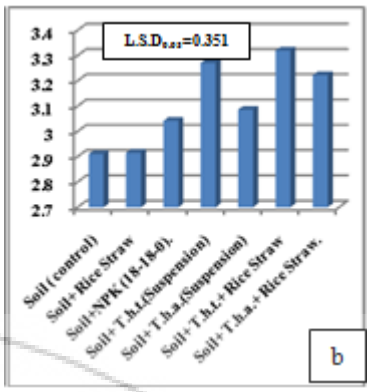




**Figure 1:** Isolated fungi speciece frequency from studied soil before & after cultivation at agriculture season 2013



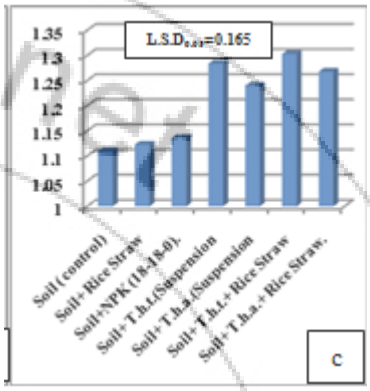
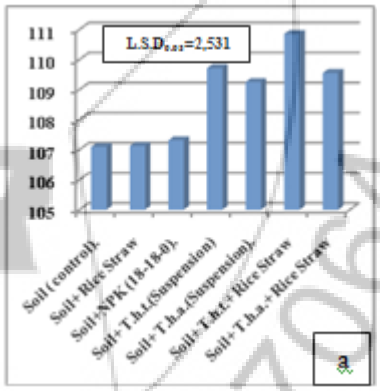
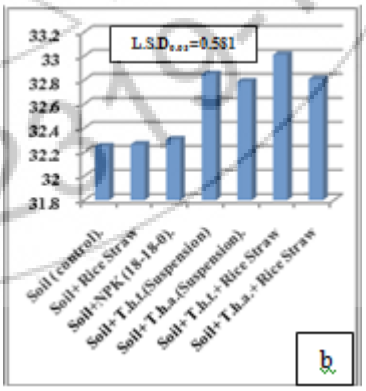
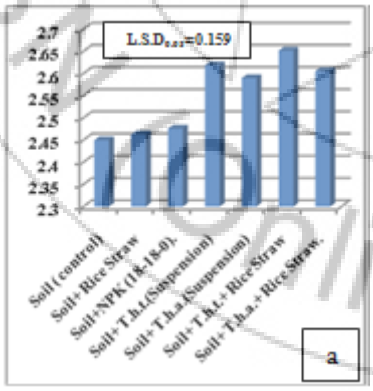




**Figure (2)** The effect of addition of biological control fungi (loaded on rice straw) to the Soil on (a) - Total Nitrogen%, (b) - Chlorophyll –A, (c) - Chlorophyll – B content (mg .$gm^{-1}$) in wheat leaves.



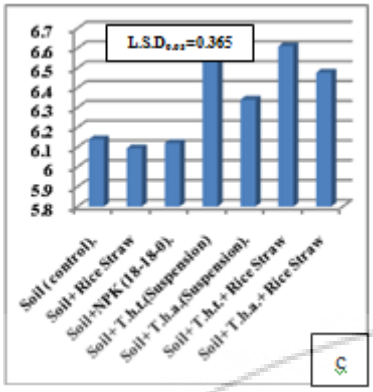



**Figure (3**) The effect of addition of biological control fungi ( loaded on rice straw) to the soil on (a) - plant height(cm) , (b)-1000 –grain weight (gm) ,(c) - wheat yield $t.h^{-1}$ for agriculture season 2013

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