

## A review on the burning of crop residue on the soil properties

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**Abstract:** Every area of soil physical properties, chemical, biological, and biochemical and other areas in the country due to other different climate and soil biological activity of micro-organisms, while the fire also has a significant impact on non-fire advice to it is necessary to improve soil structure and aggregation. Acute rapid fire action for the environment. It operates on natural ecosystems and ecosystem-based management of human, can have tremendous destructive power and polluters.

**Key words:** *Environment; Crop residue; Soil properties*

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### 1. Introduction

Plant debris has many applications; including creating a sanctuary for terrestrial organisms, barrier against rain, animal feed, fuel consumption and improve soil can be outlined. It remains in cereal straw is called. Straw contains the remains of leaves, stems and remaining awn small grain after harvest, such as wheat, barley, rye and oats, which are typically packed field, is removed. Standing stubble to stubble after harvesting the land remains. Acute rapid fire action for the environment. It operates on natural ecosystems and ecosystem-based management of human, can be very destructive power and polluters or account management tool comes. In many parts of the world granary burnt remains of grain after harvest. It has the following effects on the characteristics of the physical, chemical, biochemical and biological soil and leaves.

### 1.2. The physical characteristics of the soil

Incineration plant residues increase the sensitivity to erosion and loss of soil moisture at planting is a new product. Some experiments have shown that wheat straw burning, weight and bulk soil electrical conductivity will increase. Cereal straw burning reduces the aggregate stability. According to the test of pores larger than 1.5 mm in the soil, the land of straw, 4.1 times greater than the residual land is burned in conventional tillage.

### 1.3. Chemical characteristics of the soil

Burning of crop residue increased soil PH. This is an increase of soluble salts from the soil. Burning straw decreased soil organic matter. In addition, the

amount of water and fat soluble compounds and hemic acids show a downward trend.

Stubble burning through the influence of the nutrient, it is possible by increasing the power of fire and soil type and climatic change. Based on the amount of nutrients available to plant wheat straw burning experiments only two weeks after ignition increases. Burning stubble also caused a slight reduction in the amount of phosphorus and potassium soil and seed atmosphere. Wheat and sorghum straw burning, compared to mixing with the soil, reduce soil potassium. Some experiments also show that the burning of crop residue to reduce soil action exchange capacity.

### 1.3. Soil microbial and biochemical characteristics

Burning of crop residue on the soil surface reduces soil micro-organisms. Wheat straw burning 50 percent of the population of bacteria up to 2.5 cm cut. The amount of soil microorganisms in ground wheat straw burned compared to the land where straw was mixed with soil at about 70 percent. Following the burning of crop residue, bacteria hetero residues in the soil was more than fungi. Burning of crop residue amount and activity of enzymes involved in the cycle of mineral elements in the soil is reduced. In some parts of the world such as the Pacific Northwest burning plant residues, in order to eliminate pathogens of control with chemicals known to NVN an effective and inexpensive. In this region, the burning of wheat straw in the field to reduce the population of different species of pathogenic fungi embankment called pythium by 40 to 50 percent of the province. In some cases, the burning of crop residue on the effect of some chemicals may break dormancy inhibiting seed germination of some seeds, or the loss of it, and such. This reduced wild oat density of

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13 of 0.6 square meter plant will be. In another experiment, small grain stubble burning weed density cylindrical ancestral wheat (*Aegilops cylindrical*) greatly reduced.

## 2. Fire effects on soil biological activity

So far, very little information on the effects of fire on soil biological life is achieved. It has been reported that the fire gradually decreased soil organic matter and biological activity. One reason suggested for reducing the activity of micro-organisms, destroying them by fire. Add organic matter to the soil of the cultivation of plants and micro-organisms in the soil underneath again and areas of soils that have not been exposed to fire. Provided a food source for soil microbe's fire soil organic matter levels are severely reduced. Studies show that about 80% of plant residues by microbial oxidation process and the remaining 20% is converted into organic compounds joins. The cause of the microbial biomass production, or compounds that are easily degraded by microorganisms and increase soil biological activity.

When remains are cremated remains about 60% of the amount of its immediately (carbon monoxide) becomes and the remaining 40% of this amount, 32% will be added to the soil microbial processes and their breathing to become the 8% of the organic matter is converted. Carbon in the ash cannot exist as a food source for the microorganisms and act as a support for them. Thus, the activity of micro-organisms and population declines and soil biological processes are disrupted.

During a test plant debris and ashes from the burnt remains were added to pots containing loamy soil in the laboratory and field capacity for 10 days at 24 ° C and temperature were maintained at the end of the microorganisms was evaluated in pots. Add plant remains much more than adding ash was due to microbial activity. It must be said that the plant remains in the treatment of nitrogen were added to a large amount of nitrogen in the soil due to very high carbon to nitrogen ratio (C / N) was immobile, but the ash was added in the mixture of soil available nitrogen was more. Due to the lack of soil microbes use of ash as a source of food. Framed population declined as a result of micro-organisms and nitrogen rather than the plant was established by soil microbes.

Incineration plant residues also affect the composition of the population of micro-organisms as plant debris rotting fungi activity is more influenced by bacteria, fungi, much of the population in the soil means soil quality. Leftover food by burning straw mushrooms which is dissipated and the population is low. The balances of the bacteria tend to find it. In addition to the loss of soil organic matter, soil porosity and low permeability. So that the moisture content and soil conditioner and its adverse effect on the fungal population.

### 2.1. The effect of fire on soil properties

Structure, aggregation, mechanical strength and bulk density: Fire destroyed remnants of organic matter, and this directly affects the structure and soil granulation side effects. Due to the correlation between soils organic matter disappears and low soil pore spaces. Favorable soil aggregation fires (due to reduced organic material) and disappears over time traveling machine of soil is pressed. In addition, the decrease in organic matter, soil bulk density and soil porosity increase and decrease the side effects on the growth of plants and micro-organisms, because in these Terms of air conditioning and decreases the soil Gas Exchange. It also reduces the adhesion between soil particles causes the formation of large lumps during plowing tillage that they should do more to grind that is the subject of increased soil compaction and tillage.

### 2.2. Fire effects on crops

Almost all sources have reported that the next crop will increase the burning remains. Burning residue that remains of nutrients and need to be released directly in the biological cycle of the plant and rotting food shop and a significant increase in the next crop to be viewed. It should be noted that this term is due to the detrimental effects that this has on soil properties described in the previous discussion in time with the decrease of product due to the accumulation will face minerals, because of the product a temporary increase. In the past, farmers have shifted to operate without being aware of the devastating effects of fire, but have little today to clarify the damaging effects of this action is by arable better successor.

Effects of organic inputs over time on soil physical properties (soil aggregate stability, soil bulk density, water retention etc.) was reported by several authors (Zhang and Peng, 2006; Singh et al., 2007; Fuentes et al., 2009; Yao et al., 2009). The organic products additions to the soil increase aggregate stability by a factor of 1.1-10.0, and this increase is related to the decomposition dynamics of the inputs (Abiven et al., 2009). Soil aggregate stability is very important to avoid soil erosion. Malhi et al. (2006) reported that during a 4-year experiment, the addition of straw increased the proportion of larger aggregates by 3% for >38 mm and by 1% for 12.7-38.0 mm size and decreased the proportion of wind erodible aggregates by 1% for 0.42-0.83 mm and by 3% for <0.42 mm size. They also noted that the effects of straw retention (SR) on soil aggregate stability were improved when straw retention was combined with no tillage (NT) practice, which resulted in a lower proportion of wind-erodible aggregates (34%) and a higher proportion of large aggregates (37%).

## 3. Discussion and conclusion

Due to the disadvantages resulting from the burning of crop residue on the straw in our country, especially in the north, to prepare the land for

cultivation is done looks reduction technologies and crop residue management as one of the ways important for maintaining the ecological sustainability of farms is necessary. Including successful technologies can be used in conservation tillage systems. The tillage including no tillage methods (No-tillage) and minimum tillage (Minimum tillage) is the amount of crop residue on the soil or plant debris on the soil surface residue levels in the soil def This will not be a lot of disadvantages, especially straw alleviates the burning of crop residue.

Burning of crop residue is still a controversial issue. On the one hand, the rapid increase in production due to the release of nutrients and the other just cause adverse effects on the soil of long-term reduce product. Reported that the fire at short range to increase soil fertility and nitrogen. For micro Argansm to 5 cm in depth hurt and little competition for nitrogen are the main plant. The effects of the fire remains low because of increased water and wind erosion of soil residues on the soil surface is the main cause of the fire remains to farmers to control pests and weeds, clean and easy to rapid the land of the residue previous plowing for the next product. After years of research, scientists have concluded that the use of proper crop rotation and proper use of pesticides as a result favorable. It can also be programmed with the correct and appropriate use of machines to manage the action remains without burning them. Besides the advantages of cremation remains as to control weeds and insects (and other ways to control it there). Disadvantages such as soil erosion, loss of organic matter to the soil permeability and structure of the population imbalance and soil micro-organisms and the decline in long-term has also been reported that in some areas of the granary Three quarters of last summer air pollution caused by the burning of human remains that are harmful environmental effects and leaves. When the long-term effects of this method will be discussed in more disadvantages than advantages, it is observed that over time the quality of the soil, and consequently the growth of the crops will greatly reduce the irreparable damages Zest the and biodiversity, it is desirable to hold workshops to promote and educate the farmers with the devastating effects of the operation, supplying equipment for residue management, proper management of pests and weeds training techniques to the farmers and familiar with the rest of management remains as mulch, straw and plowing remains, effective steps to reduce the burning residue removal. This method has been proved to have adverse effects on soil quality over time, damage to soil and plant Cause and effect is devastating and destructive effects far outweigh the positive effects.

Also, due to the heat production and loss of soil structure, favorable conditions for the growth and activity of the weeds. the burning of stubble fields is wrong and has many disadvantages, adds fire to the quotation mark quotation mark Residue farms, soil

harder because of the heat and prevents germination, plant establishment and development of roots in soil .There is an old belief among farmers burning straw enhances soil fertility, but it should be justified and training farmers in the mistaken belief they erase from their minds, while the straw-burning harmful effects of addition frequently caused by air pollution in towns and villages so long columns of smoke and ash high riding in the border towns and villages. The main cause of farmers burning fields to control pests and weeds, clean up quick and easy to plowing the land from the previous crop residues for the next crop.

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