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Research Article

Therapeutic Role Of Homatherapy On Agricultural Crops And Acid Rain

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ABSTRACT

This review article seeks to find how Homatherapy has been used to enhance the tolerance of crops to the effects of acid rain. Taking the holistic view, homatherapy is a lifetime solution to agriculture as complimented by natural remedies for enhancing soil and crop resilience. This paper begins with a brief history of Homatherapy and its application in current sustainable agriculture practices. It also explains the impacts of acid rain on agriculture including the change in soil pH and nutrient absorption and the impacts are illustrated by examples. The review shows how Homatherapy can minimize these impacts by outlining its role in neutralizing soil acidity and encouraging microbial activity. The comparison of Homatherapy with traditional agricultural remedies shows that the usage of Homatherapy is more effective and less costly than chemical treatments, and eliminates the problems of negative impact on the environment and human health. Possible challenges in promoting Homatherapy are considered, for instance, scientific basis and farmer support. The article summarizes the potential benefits of integrating Homatherapy into sustainable agricultural practices, emphasizing the need for further research to optimize its application in combating the challenges posed by acid rain. This review is intended to add to the current body of knowledge on Homatherapy as a potential solution in today's agriculture.

Keywords: Homatherapy, acid rain, sustainable agriculture, crop resilience, soil health.

Introduction

Homatherapy also known as Agnihotra or Homa Therapy is a Vedic science of using fire and medicinal herbs for environmental sanctification (Berk, 2020). It entails the intake of certain organic foods sometimes in the morning and evening with a rite designed to counter environmental forces. Originated from the Atharvaveda, which is one of the four holy scriptures of ancient India, therefore Homatherapy began thousands of years ago. They apply the belief that the air is cleansed after the practice and that farming exercises have an ecological advantage, particularly for farm tractors (Dwivedi & Bajpai, 2022). From the concept of Homatherapy derived from agricultural practice, the practitioners have it that the vibrational energies from Homatherapy improve soil fertility, and plant growth, and reduce pests and diseases (Limaye, 2019). Although Homatherapy is primarily and exclusively a religious effort to enhance the quality of the environment and people, it has over time become the sphere of applicability in agriculture where it is viewed as a potential solution to the challenges of modern agricultural systems (Rastogi et al., 2022). Since that time, engineers have started to think about how the Homatherapy affects, its capability to counter ecological aggressions like pollution and acid rain on Agriculture. Such practices that have been practiced in the modern era like Homatherapy are now being expected to address sustainability and protection of the environment and few studies indicate that it can increase the soil pH; enhance nutrient absorption and tend to the competence of the crops to withstand different environmental stresses (Ram & Pathak, 2018).

As climate change, pollution and lack of nutrients in the soil are among the issues that threaten agricultural systems around the world, practices that are in tune with natural seasons, Homa therapy is suitable for the current world (Koch, 2004). With the increase in the population, climatic factors, and unfavorable conditions for agriculture affect the projected need for sustainable farming practices. The previous methods of farming using artificial fertilizers and pesticides, and monoculture production methods gave signs of the acute impact

of environmental deterioration, including erosion of the soil, the loss of soil-biological indicators, and contamination of waters. Over the last few decades, the abuse of these synthetic inputs has led to soil deterioration and low production in agriculture, which has raised eyebrows on the sustainability of food production systems (Canton, 2021). On the other hand, Sustainable agriculture is defined as practicing soil replenishment, reduced or no use of chemicals, and management of the environment for future production.

On this basis, sustainable practices may contribute to the capacity of preserving food security and the environment in the future with the augmentation of the number of species, the enhancement of the structure of the soil, and reduced pollution of the environment. In this regard, Homatherapy is being developed as an integrated concept of sustainable agriculture. Homatherapy is intended to increase the yield of the crop from agricultural production, the natural non-synthetically controlled energy, and the purification of the environment (Berk & Johnson, 2009). They also strongly argue that it cleans the environment, refreshes the soil, and enhances crop germination to enhance the productivity and quality of the crops in production (Rich & Panda, 2015). In today's world where sustainable farming techniques are the world's perspective, Homatherapy and other conventional farming methods bring ecological solutions, healthy crops, and environmentally friendly solutions (Kumar et al., 2018). The most threatening factors influencing agriculture at the present stage include acid rain caused by the fallout of sulfur dioxide (SO_2) and nitrogen oxides (NO_2) from industrial emissions. With water vapor in the air, they turn to sulfuric and nitric acids which precipitate through acid rain (Mandowar, 2023). Acid rain is very dangerous to agriculture and one of the most affected areas is the soil. Plant growth is also affected when calcium, magnesium potassium, and other nutrients become less soluble in the soil when the pH reduces due to the deposition of acid (Rahman et al., 2018). This leads to the development of low-vigor varieties that are also less competitive are easily overwhelmed by biotic factors and any form of environmental hostility and are susceptible to pests and diseases. These impacts of acid rain are numerous and are synergistic in the agricultural industry. The food crops that are grown in the areas that are affected by acid rain are hardly productive and do not develop properly because of one or the other nutrient deficiency (Fageria et al., 2008). The impacts of acid rain are always observed in areas with high industrialization, and areas with frequent SO_2 and NO_x emissions (Prakash et al., 2023). Since this has turned out to be a serious problem, there is a need to look for long-term solutions that may assist in reversing the effects of acid rain on agriculture and other affected systems.

This review aims to determine whether Homatherapy as a therapeutic practice can be of any use in managing the impacts of acid rain on crops. Although Homatherapy's benefits are well-understood in religious and ecological domains, contemporary research reporting on the application of Homatherapy in the agricultural sector is scarce and prospective. New researchers have begun to explore whether Homatherapy can help decrease the acidity of the soil, enhance nutrient availability, and improve crop resilience to environmental conditions including those caused by acid rain (Singh et al., 2023). For instance, ash which is obtained from Homatherapy and has been mineralized has been found to enhance such soil properties as the capacity to neutralize the pH of the soil that is most suitable for plant growth (Berde et al., 2015). However, the energy produced during the practice may be useful to the plant physiology and increase their resistance to environmental stresses. Thus, this review contributes to the body of knowledge on sustainable agriculture by evaluating the therapeutic effect of Homatherapy on crops. As more damage to the environment, climate change and food insecurity persist in the world, then there are numerous aspects of how to enhance sustainable agriculture. As for such issues as cleaning and natural balance, Homa therapy may be viewed as a vision of these issues, especially in the areas where the impact of acid rain is observed. In this review, our focus is to give a clear picture of how Homatherapy could have been used to support other sustainable farming practices to avoid the negative impacts of farming lands on the environment and to feed the increasing population.

Homatherapy: Concept and Principles

Homa therapy can be traced back to Vedic practice and is based on using fire to transmute the environment. One of the principles of Homatherapy is the Agnihotra ceremony which can be translated as a small ritual of making fire during sunrise and sunset (Tripathi & Singh, 2024). They spit cow dung, put clarified butter (ghee) and rice to fire, and sing Vedic hymns while burning it (Kurfirtova, 2017). This is where Homatherapy comes in and is based on the reasoning that, in addition to fire and sound, these elements can purify the air, eliminate toxins as well as induce the growth of plants using natural cosmic energy (Paranjpe, 1989; Naresh et al., 2018). Thus, it is believed that the ritual forms a region of bioenergy and it has a beneficial effect on the quality of the air within the environment, improves the quality of the soil, and increases the yield of production in crops (Berk, 2020).

Homatherapy is said to have had an organic connection with the spiritual and environmental themes as seen from Vedic India. By following the principles of Rigveda and Atharvaveda one of the methods of handling the environment includes fire rituals or Yajñas. They also emphasize the idea that Agni is the purifier and the guardian of nature and have drawn these two texts to the cycle of seasons. However, Homatherapy, as it is practiced in the modern world, was resurrected and systematized by Vasant V. Paranjpe in the twentieth century and he used it not only for spiritual therapy but also for the therapy of environment (Paranjpe, 1989). His work was very useful in popularizing the practice across the world, especially in the areas of organic farming and environmental management where he had centers in Latin America, Europe, and the United States.

Homatherapy has spiritual and material ways of relating to the environment. In the course of the Agnihotra process fire is made with cow dung, ghee, and rice where the emitting gas and ash are supposed to have a purifying impact (Kumar et al., 2018). As mentioned above, ashes that remain after such offerings include phosphorus, calcium, potash, and other potash important for plant growth (Abhang & Pathade, 2017). Additionally, the rhythmic chanting of Vedic mantras creates specific sound frequencies that resonate with the natural world, fostering a balanced energetic field that enhances the health of crops and ecosystems (Yadav, 2023). Some of these claims include the Agnihotra ash which has been scientifically proven to decrease soil acidity, reduce the growth of pathogenic microbes, and enhance the proliferation of useful microbes (Singh et al., 2021; Tuladhar et al., 2019).

Figure 1 depicted below is the method of Agnihotra, a ritual performed according to the Vedic tradition, using a pyramid-shaped copper structure to emit curative frequencies. The exercise begins at sunrise whereby heat from the sun is collected and then concentrated on the pyramid. Agnihotra creates a conduit up to 12 kilometers into the sky and yanks pranic energy down. This energy is returned to the environment and sustains plant, animal, and human life. In return, the plants provide feedback energy to the atmosphere thus continuing the cycle of healing. The diagram is devoted to the interaction between solar energy, the atmosphere, and the ecosystem and their relation to Agnihotra as the way to sustain life.

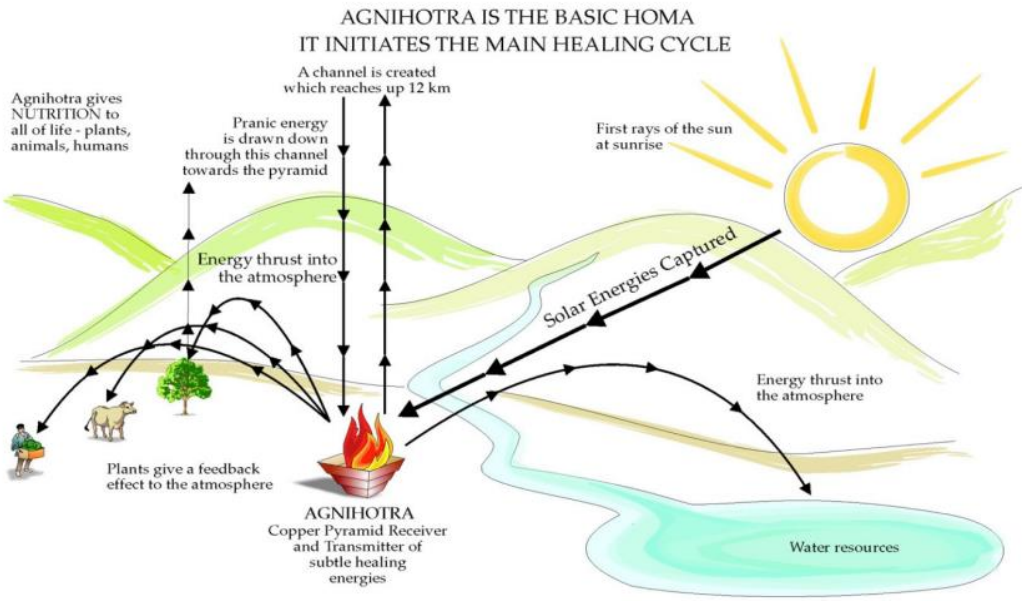

Figure 1: Agnihotra Initiating the Healing Cycle of Pranic Energy and Solar Interaction (Berk, 2020).

While Homatherapy has its origin in conventional and religious practices, specifics of this modality have only been investigated scientifically in recent years in the environmental and agricultural soil. In addition, Pathak and Ram (2013) have also found that Agnihotra ash enhances the activity of the microbial biomass in the soil and nutrient cycling and plant growth in general. Ash from Agnihotra also decreases air pollutants; sulfur dioxide and nitrogen oxides which contribute to acid rain (Bhatia et al., 2021). Similarly, the studies have revealed that Homatherapy farms helped in producing higher yields as compared to the standard conventional agricultural practices along with resistance towards pest issues and inherent soil health (Bhat et al., 2017).

However, more research has to be conducted to support these conclusions and to find out whether they apply to a wider population. In sustainable agriculture, Homatherapy has gradually been adopted as a non-chemical method of counteracting the impact of acid rain on crops. Acid rain that occurs due to the emission of sulfur dioxide (SO_2) and nitrogen oxides (NO_x) affects soil as far as degradation, nutrient leaching, and reduction of crop yield are concerned (Likens et al., 1996). Pathak and Ulrich (2015) also noted that the use of Agnihotra ash enhances the capacity of the soil for moisture conservation thus reducing soil erosion hence enhancing the stability of the agricultural system. Besides, Homatherapy has been known to bring improvement in the biological effectiveness of farmers' fields with more friendly insects and microorganisms for healthy agroecology (Khuran & Katyayan, 2024). Similarly, perhaps its heaviest burden of traditional interpretation is that it links spirituality with nature. The Indigenous and rural people of India today have been using fire rituals to balance with the environment and to show the need for people's existence, this must respect the environment (Arya & Arya, 2020). The present generation of advanced agricultural innovations however finds itself in a rather vices situation with climate change impact that has affected the quality of soils on which farming is conducted, pressure to produce food sustainably in the face of the world's ever-growing population thus the return of Homatherapy in contemporary economy. Although Homatherapy is as old as the world is, it still provokes scientific anger and can be considered an eco-friendly form of horticulture in agricultural areas.

Effects of Acid Rain on Agricultural Crops

Acid rain affects crops in several ways that affect soil chemistry, nutrient uptake, and plant health. It is mainly due to the emission to the atmosphere of sulfur dioxide (SO_2) (SO^2) and nitrogen oxides (NO_x). These pollutants are mainly generated from industries such as the burning of coal in electricity generation and fossil energy in vehicles. When in the atmosphere SO_2 and NO_x dissolve in water vapor and other constituents in the atmosphere to form sulfuric acid (H_2SO_4) and nitric acid (HNO_3) which then fall as acid rain (Benish et al., 2022). All of these pollutants are carried by wind and therefore, acid rain affects other areas which could be far from the point of emission, therefore its impacts are far-reaching (Grennfelt et al., 2020). Acid rain directly affects the ground it pollutes the soil's chemistry, particularly the chemical of PH. He informs us that this acidification provides general access to nutrients that are essential for plant growth and development. Primary nutrients such as calcium, magnesium, potassium, and the like are leached from the solution of the soil hence lowering their uptake by the plant.

Soil pH and Aluminium content at higher levels hinder the root development and water and nutrient intake ability of the crops which in turn affects the growth prospect of crops and the yield loss factor (Rahman & Upadhyaya, 2021). However, such changes in pH affect the microbial communities that regenerate nutrients in the soil and harm plant health by reducing the nutrient concentrations in the soil solution (Agegnehu et al., 2021). One region or the other of the world has reported the effects of acid rain on crops that are used for food production. The impact of acid rain on crops has been documented in various regions around the world. In the Northeast United States, for instance, soil acidification has been linked to declining productivity in key crops such as corn and wheat. Farmers in these regions have noted that they have been receiving low yields that they blamed on poor top soils due to acid rain (Singh & Agrawal, 2007). Similarly, in China, the regions that grow rice and tea such as Guizhou and Guangxi respectively have seen their yields and quality of the produce drop. The pH of these areas has increased the capacity of the soil to leach toxic metals and this has impacted the growth of rice and tea plants (Ji et al., 2020). The examples enumerated above show how vulnerable agricultural and rural economies and food-producing sectors are to the impacts of acid rain. Apart from the impacts on crop yields in the future for sustainable agriculture, the impacts of acid rain are irrelevant. The long duration of acidification has several irreversible impacts on soil particles, thus suggesting that the arid soil is already degraded (de Araujo et al., 2023).

Finally, they are used up slowly, the ability of the ground to produce plant nutrients declines, and in the extreme turns into a desert. Apart from the environmental impact, other economic losses are as a result of low agricultural yields. As it is demonstrated, the effects for farmers are high costs of liming to correct soil acidity, and crop failure is always looming, which leads to financial risk among farmers (Abate et al., 2017). This economic impact is compounded by the fact that crops grown at places where acid rain occurs are not marketable since poor soil quality results in poor-quality crops. The other impacts of acid rain on the other aspects of the environment also make these challenges complex. Soil acidification once more is very harmful to agriculture crop production as well as the bio-diversity production in the natural world. For example, acid rain affects the ecosystems by reducing the variations of plants and animals in the forests and wetlands, thus, it reduces ecosystem services in agriculture for example pollination of crops and water filtration (Izah et al., 2023). Given the severe impacts of acid rain on the environment, food security is affected due to low quality of food and poor quality of food production in the form of crops. It also puts pressure on bio-diversity and affects the other industries relying on the resources, thus limiting the ecosystem function of inflicting harm to those economies present in the areas experiencing levels of acid rain.

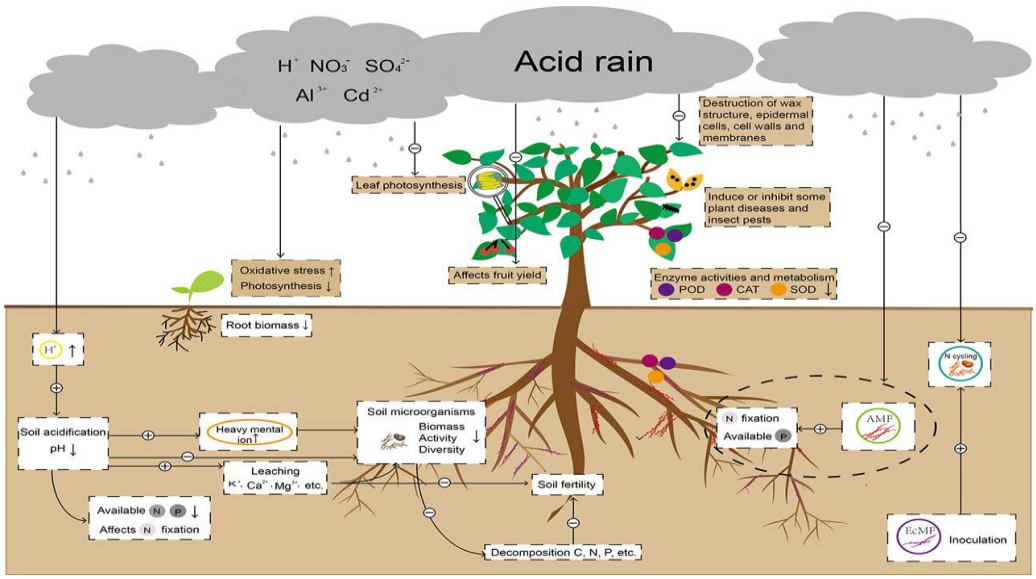

Figure 1: Impact of Acid Rain on Soil and Plant Ecosystems (Zhang et al., 2023).

The impacts of acid rain, which contains nitric (H^+, NO_3^-) and sulfuric (SO_4^{2-}) acids, on plant ecosystems and the soil are complex and are shown in Figure 1. Sulphuric acid removed toxic metal ions including Al^{3+}, Cd^{2+} , and another toxic compound found in the root leaching me advisor/nutrient intake and plant growth (Zhang et al., 2023). It presents it as a flow where acidification leads to changes in the type of microorganisms in the soil that affect root symbiosis and consequently reduce the productivity of the soil. Moreover, it shows how the nutrient solutions are leached from the soil and how the presence of such metals makes the soil toxic instead of stabilizing.

The measures necessary for the elimination of the problem of acid rain should be complex measures for the emission of pollutants and more effective agriculture, which can help to enhance the protection properties of the earth's crust. This problem can therefore be solved by the use of cleaner forms of energy, proper regulation of industries, and affirmative promotion of sustainable farming practices that do not emit SO_2 and NO_x. However, practices like the growing of acid-tolerant crops, conversation and soil management practices, and Homatherapy practices are being discussed as some of the possible solutions to the problem of soil health and crop resistance (Sharma et al., 2024).

Therapeutic Role of Homatherapy in Mitigating Acid Rain Impact

Homatherapy is a Vedic inheritance holistic system of environmental modification, an unconventional method of regulation. They include SO_2 and NO_x because they contribute to soil acidification, which is very catastrophic to agriculture. This process is also unfavorable to nutrient comfort, microbial density, and plant welfare or health (Sonwani et al., 2020). Homatherapy may be considered as one of the remedial strategies that not only solves the problem of soil health but also fits into the concept of sustainable agriculture. Disoms are released during homatherapy rituals; smoke and ash, and it is believed to have a mutual effect that may be used to reduce the effects of acid rain by reducing the acidity level (Laudine, 2009). Furthermore, the Toro is a ritual process and the public believes that it puts a good energy into the sphere of its function that makes crops more powerful. The first way that homatherapy fights soil acidity is by adding ash, which is a source of much-needed minerals such as calcium, magnesium, and potassium. These minerals assist in changing the pH level slightly higher which favours crop production according to Singh et al, (2021). It also stated that these important nutrients are washed from the soil by acid rain, thus degrading the impact on crops (Issaka & Ashraf, 2017). Thus, through homatherapy ash, a farmer can restore the lost nutrients in the soil and enhance its physical characteristics. Soil, therefore, includes nutrient cycling, the decomposition of the organic matter, and the fertility of the soil and all this owes its credit to microbial-friendly activities which establish them on the substratum of the soil. However, besides affecting the soil pH, acid rain reduces the rate of microorganisms in the soil that are essential for soil fertility for sustainable agriculture. As mentioned in the literature, homatherapy creates conditions for the return of these useful microorganisms to the body (Bose et al., 2022). Some of the minerals in homatherapy ash can replace nutrients that have been washed away by acid rain and encourage microbial activity. Higher microbial density results in improved management practices of soil structure, water, water-holding capacity, and stress presumably required for plant growth (Gurmu, 2019). To date, to the best of the author's knowledge, very little scientific evidence-based research work has been carried out on the do's and don'ts of using homatherapy to treat crops affected by acid rain but few preliminary research findings have been made. In India, the experiment was carried out on the crops undergone homatherapy and proved to have better growth and yield than the crops not undergoing homatherapy in areas susceptible to acid rain (Chaturvedi et al., 2017). The research established that crops that were treated with homatherapy did not wilt and were able to cope with the stress factors that are a result of soil acidity. Another experiment was done

to demonstrate that the application of homatherapy ash raised the soil pH by a certain percentage and this was in proportion to the vigor and yield of crops (Kratz & Schnug, 2007). But this needs further research along the scientific methods to come up with concrete evidence of the effectiveness of homatherapy in halting the formation of acid rain. Heteroherapy in farming is known as sustainable farming as it protects an environment around from the utilization of chemical fertilizers and pesticides. Homatherapy is also ecological because it mimics easily available items like cow dung and ghee and returns the loop closure for agricultural waste for farmers. The method is in line with bioorganic farming where the aim is the health of the soil, biological options, and the environment (Yadav & CGO-II, 2012). From the findings above, farmers are experiencing more impacts of climate change and other environmental factors hence homatherapy is a culturally appropriate and sustainable way of creating stability in farming.

Comparative Analysis: Homatherapy vs. Conventional Solutions

The appearance of environmental problems particularly the impact of acid rain on agriculture requires a reconsideration of sustainable agriculture. Earlier methods that were practiced in the elimination of the effects of acid rain include the use of chemicals such as lime, fertilizers, and other chemicals. Lime is normally applied to raise the pH of acidic soils and in so doing enhance the yield of crops in the region. For example, it is established that soil liming is beneficial, but it has been realized that the process of liming improves the quality of the soil since lime also minimizes the impact of acid rain on the soil for crop production (Wei et al., 2020). Similarly, nitrogen-based fertilizers particularly ammonium and nitrate have been used to compensate for nutrient washout as a result of acid rain. However, applying these fertilizers to the already acidifying soils results in more soil acidification as it is in every progressive phase (Schroder et al., 2011). Such practices may appear to provide a solution to a problem even though similar practices have been found to have numerous health and environmental impacts. Chemical fertilizer is not advisable to be used frequently because it is dangerous to the environment, and when the nutrients found in the chemical are washed by water, it pollutes water, causing water to eutrophication. This process also improves pollution of the aquatic systems while promoting the formation of dangerous algal blooms with various effects on water quality as well as on other species (Carpenter et al., 1998). However, the application of lime compacts the soil by minimizing the aeration and the biological factor that is essential for the sustenance of agricultural production systems (Shah et al., 2017). These concerns indicate that there have to be other methods of managing the impacts of acid rain on crops. Homatherapy is the term used to describe homeopathic products applied in agriculture to address these issues. Literature review indicates that homeopathic preparations enhance the stress tolerance of plants including the effects of acidity.

For instance, research showed that homeopathy can be employed in the promotion of root formation, and nutrient uptake in crops where acidity affects the healthiness and productivity of crop yield respectively as postulated by Kumar et al., 2023. This approach is not only ahead of the conventional chemical treatments in the aspect of the environment but also has the following advantages; reduced degree of chemical leaching and soil erosion. In addition, the fact that economies of scale and a cost-efficient approach to the provision of homatherapy can be achieved makes the solution relevant to farmers particularly those in the developing world. This flexibility suggests that homatherapy can be easily incorporated into various agricultural systems without the degree of support that is commonly needed for chemical applications. The cost-benefit of homa therapy has been substantiated by studies showing that farmers may get similar or even better outcomes when using homatherapy (Tripathi & Singh, 2024). Therefore, it can be recommended that, even though the chemical treatments of acid rain in the short run are efficient the impacts on both human beings and the environment are quite impractical. Homatherapy emerges as a more sustainable response to the issues generated by acid rain, and to the unproductive and environmentally damaging agricultural practices that produce it (Bhat et al., 2017).

Table 1: Comparison of Homatherapy and Conventional Practices in Mitigating Acid Rain Effects.

Aspect	Homatherapy	Conventional Solutions	References
Primary Method	Use of ash from fire rituals to neutralize soil acidity and enhance microbial activity	Application of lime and chemical fertilizers to raise soil pH and replace nutrients	Pathak & Ram (2020), Wei et al. (2020), Singh et al. (2021)
Environmental Impact	Eco-friendly, uses natural materials, no chemical runoff	Risk of chemical leaching, water pollution, and ecosystem disruption	Abate et al. (2017), Schroder et al. (2011)
Effect on Soil Health	Enhances soil microbial diversity and nutrient cycling	Can compact soil, reduce aeration, and harm microbial populations	Pathak & Ram (2013), Shah et al. (2017)

Cost Efficiency	Low-cost, requires minimal inputs	High cost of synthetic fertilizers and lime	Chaturvedi et al. (2017), Tripathi & Singh (2024)
Long-term Benefits	Sustainable, promotes soil and crop health over time	Short-term solution, may lead to soil degradation with continuous use	Ram & Pathak (2018), Kratz & Schnug (2007)

Challenges and Limitations

In total, homatherapy as an additional method of using crops has a good perspective, but the efficiency of such treatment is under question at present. Previous research has well been carried out mainly in the form of case studies or based on small sample sizes and so, has received a lot of criticism from the scientific world. Several authors have noted that while homatherapy is useful in enhancing plant health, little is known about how it does it. A majority of the published work is not well controlled and the experimental design is not very strong, which is critical in establishing protocols and demonstrating the efficacy of homatherapy in different environments. Therefore, it is required to carry out more and more extensive and intensive research to explain the biological factors that are linked with the homatherapy impacts on plants to expand the findings of Rastogi & Chaturvedi, (2023). Further, homatherapy can only work if the type of soil, kind of plant, and climatic condition of the environment are considered. These variables can define the effectiveness of homatherapy treatments in plants and this is why different authors have different outcomes. For instance, some findings indicate that some crops could benefit from some homatherapy formulations at specific concentrations, or else some crops may remain unaffected by any changes in the homatherapy formulations (Pathak & Ram, 2020). This variability is a problem for farmers and practitioners who want to use homatherapy as a reliable agricultural practice. These differences could be minimized by carrying out more extensive and varied studies to determine the circumstances under which homatherapy yields the best results and to facilitate the development of particular crop uses (Ram, 2014). Another level of complication is the integration of homatherapy into the farming community and agricultural sciences. However, some of the farmers are still reluctant to the new ways of farming due to culture and ignorance of the possibility of homatherapy (Nene, 2017). This skepticism will even be more heightened by the influence of conventional farming practices and the promotion of conventional practices. It is, therefore, necessary to continue with farmers' education and participation in different programs so that such markets are informed about the effectiveness of the response to homatherapy.

However, at other times, the legalities of using homatherapy in agriculture turn into almost impossible hurdles to overcome. In most of the regions, there are no laws that govern the use of unconventional techniques in crop production. Such kind of situation can hinder the development of homatherapy since freedom comes with lots of legalities that the practitioners cannot overcome. Policymakers should therefore support pro policies that would depict the likelihood of a positive outcome of homatherapy having been developed as well as giving the public a better shield from substandard products (Scherr & McNeely, 2008). The study also reveals that policymakers, researchers, and practitioners should collaborate to develop policies for sustainable agriculture. The actions of several stakeholders can be synchronized to establish best practices for the correct application of homatherapy while simultaneously advancing the growth of this promising area (Kremen et al., 2012). Therefore, the scientific support problems and prospects of homatherapy in agriculture are the following: deficiencies and challenges; scientific substantiation; variations in outcomes due to available environmental/biological concerns; acceptance by farmers/specialists; legal residuary. To overcome these challenges therefore there is a need to promote research, improve education, and policies that will support the practice of sustainable agriculture practices.

Conclusion

Homatherapy offers good evidence of its therapeutic nature that can be used as a model for reducing the impacts of acid rain on crops. As the impacts of acid rain become increasingly pronounced due to environmental changes and industrial activities, the need for sustainable agricultural practices is more critical than ever. Homatherapy which has holistic and natural background provides realistic and real solutions to the challenge of altering the quality of the ground, as well as the resilience of crops. Homatherapy can enhance the useful cyclical behavior of microbes by neutralizing the impacts of acidity on the soil thereby enhancing crop yields. Another aspect of the comparison of Homatherapy to conventional agricultural solutions is the brief description of the fact of its effectiveness together with the indication of the potential that exists in terms of ecological safety as a result of the exclusion or minimization of the impact of chemical supplements on the human body. However, the problems associated with scientific research, differences in results, and farmers' acceptance of homatherapy can be a major concern to homatherapy in sustainable farming practices which has all the potential to eliminate the effect of acid rain on a global level. Further research should be conducted to improve the use of Homatherapy in different activities in agriculture, the impact of Homatherapy in a broader

perspective, and how it can be adopted. This review will be useful for the improvement of Homatherapy; and support the adoption of more extensive integrated approaches in the implementation of agriculture to advance sustainable farm systems. The conclusions made in this paper contribute to the shift to more sustainable agricultural practices that will enable the world to feed the population in the future without negatively impacting the environment.

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