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Research Article

A Low-Cost Practical Approach to Markedly Improving Rice Cultivation Using Kiko Volcanic Rock Derived Pellets to Enhance the Plants' Alternative Cellular Energy (ACE) Pathway via KELEA Activation of Groundwater

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Abstract

Plants can utilize an energy source that is different from the energies provided by photosynthesis and food catabolism. Water can act as a carrier of this life force energy, which is referred to in this article as KELEA, an acronym for Kinetic Energy Limiting Electrostatic Attraction. KELEA activated water provides cellular energy and facilitates various biological processes through the Alternative Cellular Energy (ACE) pathway. Pellets composed of previously pulverized and heated volcanic rock material can increase the level of KELEA in water. Effective pellets are commercially available under the name Kiko. This article extends earlier observations regarding the markedly improved quality and quantity of rice that can be harvested from farmlands treated with Kiko pellets. The study was performed using the Jasmine ST25 strain of rice cultivated in the Mekong District of Vietnam. It compared rice growing in two composite areas of farmland, each area comprising 100 hectares. Except for the possible influence of beneficial microbes, the use of thirty (30) Kiko pellets per hectare before rice seeding reportedly achieved major benefits throughout the rice growing process. The benefits included more effective weed control, more efficient germination, and more abundant tillers, panicles, and rice grains. These benefits resulted in a remarkable 29% increase in total harvested rice and nearly 40% increase in the amount of milled rice. Specifically, the Kiko versus control harvested values were 6.2 versus 4.8 tons per hectare and the milled values were 4.3 versus 3.1 tons per hectare, respectively. KELEA activation of water is achievable using various methods, but few are currently as straightforward as the described use of relatively small numbers of Kiko pellets. Utilizing KELEA activated water should become standard practice in the production of the world's food crops, including rice.

Keywords: Rice; Kiko; KELEA; ACE Pathway; Volcanic Rock; Jasmine; ST25; Vietnam; Mekong Valley; Microbebio; Weed Control

Abbreviations: KELEA: Kinetic Energy Limiting Electrostatic Attraction; ACE: Alternative Cellular Energy; ha: hectare

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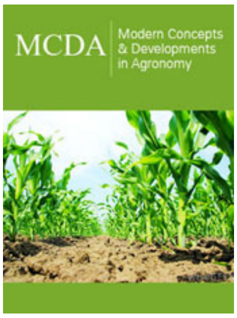

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Introduction

Heated and slowly cooled, pulverized volcanic rock material is used to form small pellets marketed under the name Kiko. In previous studies, approximately 50 Kiko pellets measuring about 3-6mm in diameter were placed into individual porous plastic cartridges measuring 2 x 12.8cm in length. Burying as few as three Kiko cartridges per acre into farmlands led to a significant increase in plant growth. This was observed in rice, sugarcane, and other food crops [1]. Adding Kiko pellets to soil can also promote the growth of weeds.

This article reports an update on the use of Kiko pellets to improve rice cultivation. It records the results of a large Vietnamese study initiated in December 2022 and extended to April 2023. This study followed several smaller studies in Vietnam in which cartridges containing Kiko pellets were used to enhance the crop yields of both OM 4900 and OM 5451 strains of Jasmine rice. The use of these cartridges increased the overall productivity from 10 to 35%. The local productivity of these rice strains has fallen in recent years, from the originally anticipated level of approximately 6 metric tons per hectare (ha). Thus, in one of the earlier studies with the OM 5451 strain, the reported yield of rice using the Kiko cartridges was only 4.1 tons per ha. Still, this production was higher than the 3.7 tons per ha harvested from the control field. Moreover, OM 5451 rice cultivated in the Kiko-treated field was of superior quality to the rice cultivated in the control fields. For instance, the assessed number of panicles per square meter was higher (543 versus 463), as was the average number of filled/unfilled rice grains per panicle (343/61 versus 296/94, respectively). The percentage of "chalky" grains was reduced in the Kiko-treated field to 30.2% compared to the control value of 50.2%. One of the factors contributing to the lower overall harvest levels in this study was infection with Rice Tungro Bacilliform Virus (RTBV). This infection gradually disappeared from the Kiko-treated field but persisted in the control field. In a detailed analysis, the nutritional profile of harvested Kiko-enhanced rice was also improved, as was its appearance and shelf-life.

It is important to extend these findings to larger farming areas. Because of the overall deteriorating performance of the OM 5451 strain, it was decided to revert to the more traditional Soc Trang 25 (ST25) strain of Vietnamese Jasmine rice. This strain is known to be more aromatic and has a better flavor than the subsequently developed hybrid strains. Stored ST25 seeds were chosen for a larger study despite evidence of bacterial infestation of the available seeds. This issue was addressed by efforts to outcompete the contaminating bacteria using a proprietary blend of non-pathogenic bacteria. Preventing the overgrowth of contaminating bacteria is especially important during the initial germination process in which the rice seeds are soaked for a day in molasses-containing water.

Non-pathogenic bacteria were supplied to the farmers by Microbebio, Inc. (Magnolia, Texas), with funding from the Global Capital Group (GCG). These bacteria have been independently shown to expedite the seed germination process. It was further agreed that the same blend of beneficial microbes would be mixed with the fertilizer. This was done, however, only with the fertilizer that was used in the Kiko fields and not with the fertilizer used in the control fields. This essentially led to two variables in the comparisons between the two groups of rice fields. To acknowledge this additional variable, the Kiko fields are subsequently identified as Kiko+ fields, with the + symbol included to allow for the possible contribution of the selectively used microbes in addition to the Kiko pellets. The Cuu Long Delta Rice Research Institute was informed of the study.

Procedure

A consortium of rice farmers in the Can Tho District of the Mekong Valley of Vietnam agreed to participate in this study. The fields belonging to these farmers were arbitrarily assigned and consolidated into two groups, now designated Kiko+ and control, with each group totaling 100ha. Loose Kiko pellets were provided for the study, rather than providing Kiko containing cartridges. Thirty (30) Kiko pellets were sprayed per ha onto the Kiko+ fields using a gasoline-powered mechanical blower carried on the back of a person walking in the fields. Kiko pellets were distributed over a period of five days. This period was 15 to 20 days before the planned addition of rice seeds to all fields, including the control fields. The early use of Kiko pellets was intended to increase the growth of both existing and dormant weeds in Kiko+ fields. The Kiko+ fields were flooded with water approximately 10 days after the addition of Kiko pellets. Farmers in the control fields also flooded their fields 5 -10 days before the planned addition of rice seeds. The flooding of rice fields is intended to destroy existing weeds.

The ST25 rice seeds were evenly placed in two large canvas containers of water with added molasses. Mixed strains of non-pathogenic beneficial bacteria, supplied by Microbebio Inc., were added to both water containers to help prevent the overgrowth of harmful bacteria that had contaminated the seeds. Several Kiko pellets were placed in the container of seeds that were intended to be planted in the Kiko+ fields. After 24 hours, water was drained from the containers. The two sets of seeds were collected and provided to the two groups of farmers to spread onto the corresponding Kiko+ and control fields, respectively. The exact amounts of the provided seeds were not specifically recorded for each farmer but from experience were likely to be approximately 50Kg per ha. The scattering of the rice seeds onto the still somewhat damp fields was performed using manually carried air blowers. The fields were again briefly flooded once the growing rice plants had grown to 2-4 inches in height.

Third-party comparisons between the rice plants growing in the Kiko+ and control fields were made throughout the entire study. Representative photographs were taken at 20, 50, and 80 days post-seeding and at the time of harvest (day 110). Where possible, quantitative measures between the rice plants growing in the Kiko+ and control fields grouping were recorded, as were the final amounts of harvested and milled rice.

Result

As recorded in Table 1, the major observations were:

1. The scattering of Kiko pellets onto the fields 10 days before the planned flooding promoted the growth of weeds. Thus, at times of flooding, there were many more visible weeds in the fields pretreated with Kiko pellets than were present in the control fields.

2. The inclusion of Kiko pellets in the molasses-containing water solution used to prepare the rice seeds for spreading onto the Kiko fields led to the noticeable development of a

minor protrusion from which the root and stem (coleorhiza and coleoptile, respectively) subsequently developed. This would have presumably increased the probability of the seeds entering the soil and proceeding to further spouting.

3. Consistent with this suggestion, there were discernably more rice plants growing in the Kiko+ fields compared to those growing in the control fields. This was noted as a denser growth of the rice plants.

4. Also apparent was that the leaves of the growing rice plants in the Kiko+ fields were consistently of a darker green color than the more yellowish-green color of the leaves of the rice plants in the control fields.

5. The plants in the Kiko+ fields were studier and with deeper root growth compared to the plants in the control fields.

6. There was an essential absence of weeds in the Kiko+ fields, although they were present in the control fields.

7. There were no signs of snail, rodent, or fungal (blast) damage to the plants in the Kiko+ fields, whereas each of these causes of plant damage occurred in the rice plants in the control fields.

8. There was earlier formation and increased numbers of tillers with subsequent panicles in the plants in the Kiko+ fields. The estimated difference was 11-13 panicles on average in the plants grown in the Kiko+ fields, compared to 8-9 panicles on average in the plants grown in the control fields.

9. The rice grains on the plants in the Kiko+ fields first became apparent at 74 days after planting, compared to 85 days for their first appearance of rice grains in the plants of the control fields.

10. The diameter of rice grains from the fully developed plants growing in the Kiko+ fields was assessed as being larger by about 10% than the rice grains from the plants growing in the control fields.

Table 1: Improvements in rice seed germination and in the quality and quantity of cultivated, harvested, and milled rice in fields with applied Kiko pellets as a means of enhancing the ACE pathway of the rice plants.

Reported Observations	Combined Rice Fields with Kiko Pellets	Combined Rice Fields without Kiko Pellets
Total areas of the rice fields in each grouping	100 hectares	100 hectares
Difference occurring in the rice seeds after soaking a day in water with or without added Kiko pellets	Slight protrusions indicative of beginning of stem & root growth	No protrusions noted
Density of developing rice plants following the spreading of the rice seeds onto the rice fields	Increased density	Usual density
Contaminating weeds	Absent	Present
Vitality characteristics of rice plants	Deeper green: Longer roots	Yellow-green color: Usual roots
Number of panicles per plant	11-13	8-9
Time of first appearance of rice grains	Day 74	Day 85
Signs of plant damage from snails, rodents & mold	Absent	Present
Ease of removing husk from the rice kernel	Easy	More difficult
Color and luster of de-husked rice	White & lustrous	Off white, less lustrous
Tons of rice harvested	620	480
Loss of harvested rice grains due to milling	30%	35%
Tons of available rice after milling	430	310

When it came to harvesting, the yield of the husked grains from the Kiko+ fields were 620 tons (6.2 tons per ha). This yield was 29% greater than the 480 tons yield from the control fields (4.8 tons per ha). It was further noted that the husks separated more easily from the grains harvested from the Kiko+ fields. This was reflected in more efficient milling with a loss upon milling of 30% of the final amount of rice produced from the Kiko+ fields (leaving 430 tons of marketable rice) compared to a 35% loss of the rice produced from the control fields (310 tons of marketable rice). This represents a nearly 40% increase in marketable rice yield. Furthermore, the rice from the Kiko+ fields was whiter, slightly longer, wider in diameter, more aromatic, tastier, and with less breakage compared to the rice produced from the control fields. Based on prior studies, the harvested rice was anticipated to have a longer shelf and more suitable for export.

Discussion

The benefits of using Kiko pellets in rice cultivation are attributed to their ability to directly increase the KELEA level of the groundwater. As this water adjacent to the pellets becomes activated, it can further extend the water activation process by attracting and transferring additional KELEA in an outward and deepening manner [1-3]. This is such that 30 pellets per ha are sufficient to provide the overall conversion of regular groundwater to KELEA activated groundwater. The KELEA activated water provides added cellular energy to the microbes in the soil and to the growing rice plants via the alternative cellular energy (ACE) pathway [1,2]. The beneficial effects of the KELEA activated water are apparent throughout the growth of the rice plants and result in the increased quantity and quality of the harvested crops.

Likely interpretations can be offered for some of the additional observations. For example, the darker green color of the plants growing in the Kiko+ fields is consistent with the plants having a higher amount of chlorophyll than what is present in the more yellowish-green colored control plants [4]. Moreover, the latter appearance is typically viewed as a need for additional nitrogen-containing fertilizer. Particularly noteworthy during the growing period were the increased numbers of tillers, the earlier appearance of the rice grains, and the increased size of the grains in the plants growing in the Kiko+ fields. These characteristics can be genetically determined [5,6], implying the possibility that the KELEA activated water can induce changes in gene transcription.

Rice plants in the Kiko+ fields were also sturdier throughout the growing period with deeper extending root structures. This can lead to better protection from damage due to adverse weather conditions. The reduction of snail, rodent, and fungus damage further indicates the greater vitality of the plants grown in Kiko+ treated fields. It also meant that farmers of the Kiko+ fields could avoid the use of herbicides and rodenticides.

Although not measured, it was generally understood that the Kiko+ fields had received less overall fertilizer. Whether the beneficial bacteria selectively included in the fertilizer used on the Kiko+ treated fields had any direct influence on the growth of the plants remains uncertain. Furthermore, the reported observations in the present study are consistent with the earlier Vietnamese trials using the OM 5451 and OM 4900 strains in which no beneficial bacteria were utilized. A synergistic effect has since been observed in the combined use of Kiko pellets and beneficial bacteria in the germination of other plants.

A useful observation reported in this article relates to the value of using Kiko pellets before water flooding in the suppression of the subsequent growth of weeds. Unlike most terrestrial plants, rice plants can survive and even thrive in flooded or waterlogged fields [7,8]. This is due to several factors including.

i) their having aerenchyma (gas channeling) tissues in their stems and roots,

ii) small stomata, and

iii) their capacity to rely upon anaerobic metabolism. For this reason, some communities grow their rice in flooded "paddy" fields.

The flooding of a field is also commonly used before and shortly after rice planting to kill the existing weeds. This practice will not, however, prevent dormant weed seeds from subsequently sprouting and growing alongside the rice plants in non-waterlogged soils. A major innovation in the use of Kiko pellets in rice cultivation is their ability to hasten the germination of otherwise dormant weed seeds before flooding. This approach has led to the complete flooding-mediated elimination of weeds in both the present and in several prior rice studies in Vietnam.

In conclusion, significant increases in rice production, in the order of approximately 30% of harvested rice and nearly 40% of milled rice, can be achieved by scattering a relatively small number (30 per ha) of Kiko pellets onto the land intended for the cultivation of rice. As will be explained in more detail in other publications, the Kiko pellets are viewed as a cost-effective means of increasing the local availability of a life force energy, referred to as KELEA, an acronym for Kinetic Energy Limiting Electrostatic Attraction. KELEA is the driving energy for the Alternative Cellular Energy (ACE) pathway in all life forms. The ACE pathway differs from cellular energy obtained from photosynthesis and food metabolism. It is recommended that Kiko pellets or comparable products that enhance the ACE pathway be routinely used in rice cultivation and in other agricultural applications. This will add to the world's food security.

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