Review Form 1.7

Journal Name:	**Asian Journal of Research and Reviews in Physics**
Manuscript Number:	**Ms_AJR2P_101992**
Title of the Manuscript:	**DETERMINATION OF SOME PHYSICAL PROPERTIES AND ELECTRICAL CONDUCTIVITY OF LOAMY SOIL WITH ADDITIVES.**
Type of the Article	**Full Review ARTICLE**

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This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty'**, provided the manuscript is scientifically robust and technically sound.
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PART 1: **Review Comments**

	Reviewer's comment	**Author's comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Compulsory REVISION comments 1. **Is the manuscript important for scientific community?** (Please write few sentences on this manuscript) 2. **Is the title of the article suitable?** (If not please suggest an alternative title) 3. **Is the abstract of the article comprehensive?** 4. **Are subsections and structure of the manuscript appropriate?** 5. **Do you think the manuscript is scientifically correct?** 6. **Are the references sufficient and recent? If you have suggestion of additional references, please mention in the review form.** **(Apart from above mentioned 6 points, reviewers are free to provide additional suggestions/comments)**	1. **The article is beneficial for community with a lot of effects.** 2. **The title is well defined and suitable** 3. **The abstract needs to be modified and more comprehensive** 4. **The subsections are competing and well organised** 5. **It is scientifically correct** 6. **References are enough** 7. **I add some comments down with full details;-** - This is an interesting study and the authors have collected a unique dataset using cutting edge methodology, literature reviews. - The paper is generally well written and structured. - However, in my opinion the paper has some shortcomings in regards to some data analyses and text, and I feel this unique dataset has not been utilized to its full extent -it needs alphabetical review, adjust fonts, spaces, paragraphs, do all same font with same design -adjust abstract as in form of introduction, methods, result, and conclusion. -remove all graphs, tables, legends or figures from inside article and put all after references at end of article -review all references and adjust font, design for all references and organize in numerical order -review discussion paragraph as a whole -the research Is relevant and interesting -the paper is well written, the text is clear and easy to read but needs some font, design and alphabetical review with corrections -the conclusion is consistent with the evidence and arguments presented - Maximum 1000 words allowed per research	
Minor REVISION comments 1. **Is language/English quality of the article suitable for scholarly communications?**	1. I think English language is well adjusted and suitable for the article. - Where improvements are needed, a recommendation for major revision is typical. - I am ready to do the post-revision review too. -Review title as first. -Add name of author, affiliation, qualifications abbreviations after title -the English is understandable but the paper has some typographical and grammatical errors -Add any conflict of interest	

	-Add any acknowledgements -Add any sponsorship or financial support - Keep images, graphs and data tables in clear view at end of article - You need to check referencing for accuracy, adequacy and balance. -limit research article to maximum 1000 words. -add more keywords.	

Optional/General comments	- Good research, worthy for study - the Abstract highlights the important findings of the review of fertilizers. -the tables or figures, aid understanding and superfluous - the research Is relevant and interesting - good sampling in analytical papers -clarify the validity of questions, the use of a detailed methodology and the data analysis being done systematically (in qualitative research) - good reviews of all types and modalities of fertilizers used for agriculture in India - the paper's premise is interesting and important - the methods used are appropriate - the data support the conclusions **Article after Grammar corrections:-** **Determination of some physical properties and electrical conductivity of loamy soils with ad ditives. Abstract** In this study, the electrical conductivity and physical properties of **loam** samples **were measured. Electrical** conductivity **meters have been** used to **determine** electrical conductivity and some standard methods have been adopted to obtain other properties. It **can be seen** that the soil combined with NPK **has** the highest electrical conductivity with the **lowest** soil (control). It **was** concluded that NPK **increases** the electrical conductivity of the soil. **It measures** the amount of **salt** in the soil **(soil salinity),** which is an important indicator of soil health. **This** affects **soil microbial activities that affect key soil processes, including yield,** cro p suitability, plant nutrient availability, and greenhouse **gas emissions** such as nitrogen oxides, **methane** and carbon dioxide. It is recommended **to use organic fertilizers in the** soil to maintain low salinity and good soil health. Keywords: **denitrification, nitrification, nitrogen oxides, saline/sodium soil, electrical conducti vity** (EC), **soil organic carbon** (OC). **One.** INTRODUCTION Soil data is used for the assessment of land condition, modelling soil function. Primary threats to soil function include soil salinization and decreasing levels of soil organic matter content [1]. Soil salinity is a major physico-chemical constraint in environments typical of the south-west Pacific region, with an impact on yields at the farm scale and the regional scale [2-3]. The decline in soil organic matter content (and carbon) in Australia has been considerable and is due to land clearance, removal of native vegetation and implementation of conventional cropping practices[4-5]. The impacts, however, of current farming systems and management practices on organic matter distribution are not as clearly distinguished as climatic and soil differences [6-7]. While there have been recent efforts to understand the nature of key factors influencing the distribution of organic carbon content across Australia [8], there are still significant gaps in contemporary soil information on the decline in soil organic matter. Likewise, accurate assessments of soils affected by salinization are problematic owing to this dearth of soil data and information [1]. Soil organic carbon content and soil electrical conductivity are properties fundamental to these types of assessments. There has been considerable effort in the last decade to conserve and make available soil profile data for future applications [9]. Studies to date have shown that broad environmental influences such as climate, landform and parent material over variable time frames are key factors in explaining the distribution and occurrence of soil properties, including electrical conductivity (EC) and soil organic carbon content (OC). Soil EC is a measure of the amount of **salt** in **the** soil **(soil salinity). This** is an important indicator of **the condition of the soil. This affects** soil **microbial activities that affect key soil processes, including yield,** crop suitability, plant nutrient availability, and greenhouse **gas emissions** such as	

	nitrogen oxides, **methane** and carbon dioxide. **Excessive salinity affects the water balance of the soil and hinders** plant **growth.** Soil s **with excessive salinity** occur naturally in arid and **semi-arid** climates. **Salinity** levels can increase as a result of **agriculture, irrigation** and land management. **Conductivity** does not provide a direct **measure** of specific ions or salt compounds, **but is** correlated **with nitrate,** potassium, sodium, chloride, sulfate, and **ammonia concentrations.** For **some** non-saline soils, determining **the** EC can be a convenient and economical way to estimate the amount of nitrogen (N) available for plant growth. There have been **many studies** on **soil** electrical conductivity **measurements with** some measurement **methods.** For **example, in** [10] an empirical **dependence (Archie's** law) **was proposed** based on laboratory measurements of **pristine sandstone** samples. **However, Archie's Law** only **applies to** saturated **rocky** or sandy **soils. [11–12] In the course of laboratory studies, we** observed that the electrical resistivity of **soil** decreases **with increasing** water **content.** The **structure,** i.e. **pore** distribution, **pore geometry, connectivity** and porosity, **determines** the **ratio** of air to water according to the water potential. [13] **established that the related** resistivity **changes for** the structure of **soil** materials, high and low **values of** resistivity **are** related to macro- and meso-porosity, respectively. Temperature can excite and change the viscosity of a **liquid** and **affect its** electrical conductivity [14]. **Laboratory** experiments **performed** on 30 samples of saline and alkaline **soils** [14] showed **an increase in electrical** conductivity **of** 2.02% per **degree Celsius (over** the range of **15–35 degrees Celsius).** However, **few** studies **have been reported** on problematic unsaturated soils such as expansive **soils, laterite soils** and **loess. Laterite soils** are **widespread** in several **regions** of **southwestern China,** such as Hunan, Guizhou, Yunnan, and Guangxi. **Laterite soils are generally** considered good natural **foundations** and building **materials.** However, **laterite soils have** many unfavorable **characteristics** such as shrinkage, **cracking, moisture sensitivity,** and uneven distribution. Thus, the usage of lateritic soil as a building mate-rial leads to various challenging issues in constructions of highway and high speed railway in these southwestern provinces in China. In those projects, the crack depth, water content and distribution are approximately obtained by borehole surveying, exploration holes, trenching exploration, and pit test. These geotechnical investigations involved extensive workload, time-consuming and low effect. Electrical conductivity experiment offers an attractive tool for describing the subsurface properties without digging, and thus much time and effort can be saved. Examining of soil water content which is probably the most easily identified soil property is an essential matter for agricultural arrangement. Information about water content in near-surface soil is vital for estimating land atmospheric interaction, water balance, infiltration, and deep percolation or recharge. The information acquired from surveying is crucial for optimizing crop yields, accomplishing high irrigation efficiencies, minimizing lost yield due to salinization and waterlogging, and planning irrigation scheduling. Soil electrical conductivity is a function of clay content, water content and salinity [17]. Lately unparalleled attention has been given to the study of the salinity content of the soil in various arid regions of the world via artificial intelligence and other technique [16–21]. However, to the best of our knowledge, no study in the literature had tackled the electrical conductivity of loamy soil with various organic and inorganic manures, which are often used to improve agricultural yields by farmers. This **article** is **structured** as follows. Section **2 presents** the materials used **and methods adopted** to **conduct** the **study. Section 3 summarizes the results obtained,** and **Section 4 discusses** the results obtained in **Section 3. Section 5 concludes** the **study by highlighting** our **results.** 2. MATERIALS AND METHODS 2.1. Materials Plates, bowls or small containers, Table spoon, 100-mL graduated cylinder, stirring rod slightly longer than graduated cylinder, manure (organic and inorganic), and loamy soil, Drying oven, Dryers, pH meter with glass electrodes, Thermometer, Glass beaker (100 ml), Glass rod, Digital conductivity meter, Conductivity cell, Glass beaker (100 ml) and Glass rod. 2.2. Methods 2.2.1 Determination of the Porosity Standard test is with manure, soil and a mixture of these (1/1 by volume). Of course, other soils and mixtures may be added. Fill the graduated cylinder about half full with the sample. Tap the cylinder firmly with your fingers several times to settle the sample. Record **"Volume** of **Packaged Sample".** Pour the sample and **keep** it **for** use. Fill the graduated cylinder **with water** to	

	the **70ml level. Add samples slowly** from **stored samples.** Stir with a **stick** to break up **clumps and** let stand for 5 minutes to **deflate.** Record the final **"Sample/Water Mix Volume".** Calculate the volume of solids in **the test sample.** 2.2.4 **pH** Determination **Add 20 g** of sample **to** a beaker. Add 50 ml of distilled **water, mix well** with a glass rod for about 5 **minutes,** and **leave it** for **30 minutes.** In the **meantime,** turn **on** the pH meter **and let** it warm up for 15 minutes. Standardize the glass electrode using **pH 7** standard buffer and calibrate with pH 4 or pH **9.2 buffer. Immerse** the **electrode** in **a beaker** containing the **aqueous** sample suspension **under** constant stirring. While recording the pH, switch the pH meter to **the** pH reading, wait 30 **seconds,** and record **the** pH value to the nearest 0.1 unit. **Switch** the pH meter **to** standby mode immediately after recording. Remove the **electrode** from the sample suspension and clean the **electrode** with distilled water. Rinse the **electrode** after each **measurement** and **wipe thoroughly** with filter paper before the next **measurement.** Standardize the glass **electrode** every **10 cycles.** Dip the electrodes in distilled water, when not in use and ensure that the reference electrode always contains saturated potassium chloride solution in contact with solid potassium chloride crystals. Three to four drops of toluene are added in standard buffer solutions to prevent the growth of mould. 2.2.5 Measurement of Electrical Conductivity (EC) in Soil Calibrate the conductivity cell with the help of standard KCL solution and determine the cell constant. The soil water suspension of 20 gm: 50 ml ratio prepared for the determination of pH can also be used for conductivity measurements. After recording the pH, allow the soil water suspension in the beaker to settle for an additional half an hour (the total intermittently shaking period is 1 hr.) After the calibration dip the conductivity cell in the supernatant liquid of the soil water suspension. **Measures** the conductivity of the test solution **over a precise conductivity range.** Remove the **cells** from **the** soil suspension, **rinse** with distilled water and **place in** a beaker **with** distilled water. EC is expressed as **dS m–1. When not in use, immerse** the **conductive** cell in distilled **water.** Record the temperature of **the aqueous** soil suspension during **testing. three. Results Electrical** and physical properties of various samples **were obtained during the study.** Table 1 shows the numerical values **of** these properties and **shows them in the figure.** 1 **is** a **pH histogram** of **five samples. For comparison,** the pH of the **soil mixed with cow dung was** the **highest,** followed by soil **+ bird** droppings, soil **+ urea,** soil **(control),** and soil **+ NPK. on figs.** 2 **is a histogram** of electrical conductivity **of** soil samples. **Soil mixed** with NPK had the highest electrical **conductivity,** followed by **soil + cow dung, soil + bird dung, soil + urea,** and soil. **on figs. Figure** 3 shows **a histogram** of **moisture** content (%) for soil samples. Soil **mixed** with urea had the highest moisture content, followed by soil **and cow manure,** soil **and** poultry, soil **and NPK,** and soil **(control). FIG.** 4 **is a histogram** of porosity (%) of samples. The porosity of soil samples was found to increase in the following order: soil **+** NPK (highest), soil **+ bird,** soil (control), soil **+ urea,** soil **+** cow **manure. on figs.** 5 **is a histogram of** the soil density of **the** samples. The **densest samples were** found to be **urea-bound soils.** soil **+ cow dung,** soil **+** NPK, soil (control) and soil **+** poultry. 5. **Conclusions** In this study, the electrical conductivity, **water** content, density, pH and porosity of **loam samples are determined.** Several methods have been used to obtain these properties. It **can be seen** that the soil combined with NPK **has** the highest electrical conductivity with the **lowest** soil (control). It **was** concluded that NPK **increases** the electrical conductivity of the soil. **It measures** the amount of **salt** in the soil **(soil salinity). This** is an important indicator of **the condition of the soil. This affects** soil **microbial activities that affect key soil processes, including yield,** crop suitability, plant nutrient availability, and greenhouse **gas emissions** such as nitrogen oxides, **methane** and carbon dioxide.	

PART 2:

	Reviewer's comment	**Author's comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Are there ethical issues in this manuscript?	*(If yes, Kindly please write down the ethical issues here in details)*	

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