

CELEBRATING
COMMERCIALISATION
YEAR 2014

iiindex 2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

invention
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exposition 2014

INNOVATEUR
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2014

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UNIVERSITI TEKNOLOGI MARA
MALAYSIA

*Bridging
the valley of death :
advancing the
commercialisation
of research*

RESEARCH BOOK

iiindex2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

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FOREWORD

The Honourable Minister of Science, Technology and Innovation (MOSTI) has launched 2014 as Malaysia Commercialisation Year 2014 (MCY2014) with the theme Science Technology and Innovation (STI) for Wealth Creation. In line with this theme, Invention, Innovation, Design & Exposition 2014 (iidex2014) is an annual exposition organized by UiTM and is the ultimate platform to highlight and commercialise new inventions and innovations. Researchers and inventors will exhibit their products which cater to the needs and wants of the community and the country.

The iidex2014 creates a new dimension by fusing two competitive concepts, a competition among innovative products and a competition to invite Innovateur Wannabes to perform live pitching of their products to the audience. The iidex2014 focuses on comprehensive commercialization and creating opportunities for entrepreneurs to carry out R&D as well as to provide avenue to commercialise their products. Through expositions such as iidex2014, MOSTI hopes to inculcate the culture of commercialisation of new technology designed and created by Malaysians.

I wish to congratulate all the participants of the iidex2014 and this is the opportunity for all researchers to show their ideas and exhibits their products and creativity. Apart from showcasing their products, innovators will have the opportunity to provide a window to the industry for business matching during the exposition.

Tan Sri Dato' Sri Sallehuddin Mohamed
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SPRINKLER SYSTEM FOR STADIUM UiTM

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Irrigation system is commonly used in watering lawn and field. There are three basic types of irrigation system, they are the sprinkler, drip and surface which are applicable to work in particular conditions. Sprinkler system is basically used for field applications, based on the size and shape of the area irrigated includes the flow rate and pressure of water supply. Basically, there are four types of water distribution pattern which are full-circle, half-circle, three quarter-circles and quarter circle. Most manufactures make sprinklers that can be easily adjusted to supply water to almost any portion of a circle. These patterns were designed to avoid overspray beyond the irrigated area. Currently, UiTM stadium's field with the size of 110 meter length and 72 meter width is watered using the sprinkler irrigation system. Water is distributed through 35 individual sprinklers with 7x5 arrangements so that it breaks up into small water drops which fall evenly to the field. In the actual system, total overlapping area is 7920m². The system has too many overlapping area which leads to the waste of water. This proves that the system is inefficient. Therefore, the purpose of this study is to enhance the existing sprinkler's arrangement that can minimize the number of sprinklers used. A good strategy in managing the sprinkler arrangement is necessary since the amount of water used can be optimizes. This research only considers the radius of water projection as the sufficient condition that must be satisfied in developing new sprinkler arrangement. In order to design possible sprinkler layout, the sprinkler arrangement with less than 7x5 are fitted to the ratio of the field's length and width is considered. Hence, total number of sprinkler, distance between two sprinklers at length side and width side, radius of water projection and total overlapping area are calculated. The assumption has being made by increasing the distance between sprinklers. It will help to reduce the irrigation overlapping area. By having one meet point between the area covered by four blades (or petals), this helps to reduce uncovered area. There are four possible arrangements that satisfied the four conditions which are; field's size, total number of sprinkler; sprinkler's water projection radius; and total overlapping area. However, the results may change depends on the requirement of the operation system. For example, if needs are to minimize the number of sprinkler, they can choose minimum number of sprinklers layout. Likewise, if they want to reduce the cost of water, they can choose amount of sprinklers layout which carried out about minimum number the total overlapping. Validity of the proposed arrangement can be seen in Maplet worksheet. These interfaces are easily accessible by inserting the total number of sprinkler at the length and width. This helps to validate the validity of the proposed sprinkler arrangement. As an overall, this research gives idea in how to arrange a sprinkler in field or in large lawn size. The goals of this research are achieved. The total number of sprinkler is reduced and it can be conclude that the total overlapping area decrease as the distance between sprinklers at length and width increases. Both of these obliquely will minimize the amount of water used and inherently reduced the maintenance cost. If sprinkler arrangement is properly selected, the cost of system will be reduced. Besides, if the systems are properly set up, all uncertainty like overspray and wasted water can be avoided.