

**A REVIEW ON CONTRIBUTION OF TRANSGENIC PADDY  
(*Oryza sativa* L.) TOWARDS ENHANCING NUTRITIONAL VALUE**

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**Final Year Project Report Submitted in  
Partial Fulfilment of the Requirements for the  
Degree of Bachelor of Science (Hons.) Technology and Plantation Management  
in the Faculty of Plantation and Agrotechnology  
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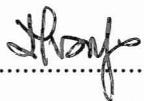
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## DECLARATION

This Final Year Project is a partial fulfilment of the requirements for a degree of Bachelor of Science (Hons.) Technology and Plantation Management, Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA.

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I hereby declare that I have checked this project and in my opinion, this project is adequate in terms of scope and quality for the award of the degree of Bachelor of Science (Hons.) Technology and Plantation Management, Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA.

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*“Manage your time wisely,  
and make good deeds to other, and may it reply with kindness”  
-Dr. Asmah Awal*

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## ABSTRACT

### **A REVIEW ON CONTRIBUTION OF TRANSGENIC PADDY (*Oryza sativa* L.) TOWARDS ENHANCING NUTRITIONAL VALUE**

This literature review is to determine the relationship between the growing population with the rice production demand, and micronutrient malnutrition rate. Micronutrient malnutrition refers to the condition where individual unable to intake sufficient amount of macronutrients that compose largely of Vitamin A, Iron and Vitamin B9 and do not show obvious symptoms (Ruel-Bergeron *et al.*, 2015). Micronutrient malnutrition severely affects both in under develop and developing countries. This incident occurs due to the expensive prices of vegetables and fruits, and low accessibility to obtain the nutritious vegetables and fruits compare to the high incomers, but micronutrients malnutrition also effect overweight children due to the unbalance food consumption that largely cause by salt, sugar, and addictive flavor. Several approaches like pharmaceutical supplementation, industrial food fortification, and diet diversification did help in reducing the micronutrient malnutrition problems but all the approaches success on the minimum rate. Thus, the research and development of transgenic rice rich essential micronutrients through bio-fortification method is another novel strategy to combat off the micronutrient malnutrition. Rice is a low micronutrients – major staple crop for almost half of the world population especially in under develop and developing countries. Even though, the rice production of 1st generation of transgenic rice with high yielding output increase over the year, but it is still not enough to deliver enough intake of needed essential micronutrients. Then, the 1st generation of transgenic rice shifts to the 2<sup>nd</sup> generation of transgenic rice which are more consumers – friendly focusing on the nutritional value enhancement on the edible rice endosperm. The method of elevating the nutrition content is focusing on the rice endosperm; the edible part of the rice plant breaks the inefficient previous methods of pharmaceutical supplementation, industrial food fortification and diet diversification.