

Chapter 9

Enhanced Fuzzy Assessment Methodology to Find Overlapping in Membership Function Using K Ratio to Find the Yield of Rice

M. Kalpana

Tamil Nadu Agricultural University, India

A. V. Senthil Kumar

Hindusthan College of Arts and Science, India

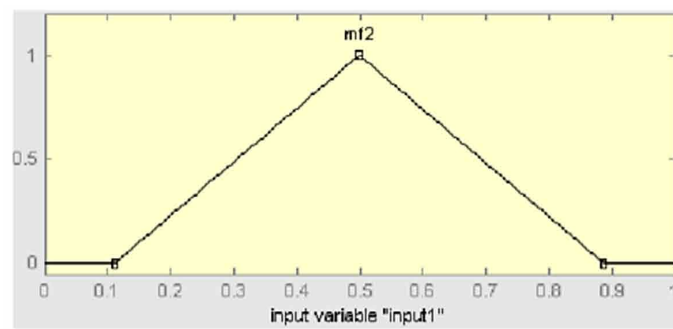
ABSTRACT

Fuzzy expert systems are designed based on fuzzy logic and deal with fuzzy sets. Many fuzzy expert systems have been developed for diagnosis. Fuzzy expert systems are developed using fuzzification interface, enhanced fuzzy assessment methodology, and defuzzification interface. Fuzzification helps to convert crisp values into fuzzy values. By applying the enhanced fuzzy assessment methodology for rice, the yield parameters of rice can be diagnosed with number of tillers per hill, number of grains per panicle, and 1000 grain weight. Pest and disease incidence becomes simple for scientists. Enhanced fuzzy assessment methodology for rice uses triangular membership function with Mamdani's inference and K Ratio. Defuzzification interface is adopted to convert the fuzzy values into crisp values. Performance of the system can be evaluated using the accuracy level. Accuracy is the proportion of the total number of predictions that are correct. The proposed algorithm was implemented using MATLAB fuzzy logic tool box to construct fuzzy expert system for rice.

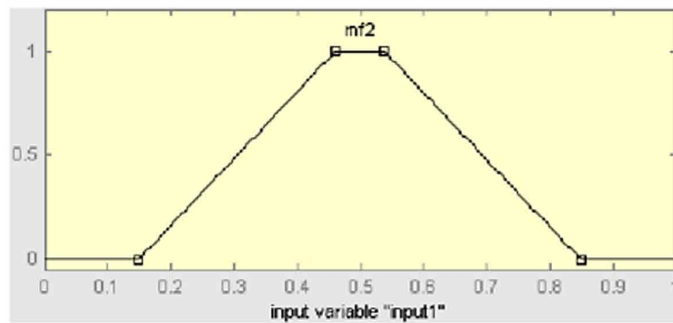
INTRODUCTION

Fuzzy Expert System is developed with the concept of fuzzy logic and fuzzy set. The fuzziness of the fuzzy set is given by the membership function. Membership function is designed for input variable with the labels. Membership function helps to make out the numerical range of the input values with respect to the label. The different shapes of membership function are triangle, trapezoidal and bell as show in Figure 1.

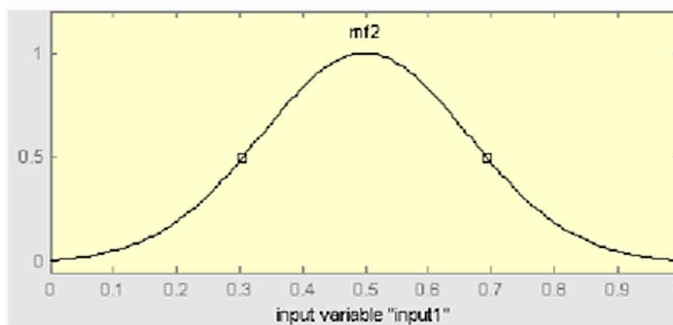
Figure 1. Membership function shapes



(a) Triangle shape



(b) Trapezoidal shape



(c) Bell shape

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