

ENERGETICAL ANALYSIS OF SESAME (*SESAMUM INDICUM* L.) AGRO-ECOSYSTEM IN NORTH-WESTERN ARID REGION OF THAR DESERT

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Abstract. *The aim of this study was to analyse the energy requirements, efficiency of solar energy capture and energy production rate (both on dry weight basis and ash free dry weight basis) of sesame agro-ecosystem so that a general criteria could be design for better understanding of energy flow in agro-ecosystem of sesame. In the present investigation the energy content of various plants parts, viz. root, stem, leaves and seed of sesame crop was determined. The maximum energy content was in seed (4217.80 cal/g) and minimum energy content was shown by roots (2920.7). the highest EC (0.708 %) was recorded during kharif of 2009 and lowest EC (0.476 %) was recorded during kharif of 2008.*

Keywords: crop production, ecosystem, Thar Desert, effective energy.

INTRODUCTION

Agriculture especially crop production is the mainstay of Indian economy. In terms of vegetable oil India is the fourth largest oil economy in the world. Agro-ecological conditions in the country have supported commercial cultivation of seven annual edible and two non edible oilseed crops. There has been a continuous improvement in the production and productivity of oilseeds in India in the last 55 years despite wild fluctuations from year to year in response mainly to climatic condition. The area under oilseed crops has been fluctuating between 20 to 25 million hectare with production varying 20 to 27 million tones. The productivity has been around 800 kg/ha. This shows that production of oilseed crop has been static.

The calculation of energy flow within ecosystem is an important factor in productivity studies and required caloric determinations of composite community of ecosystem (Leith, 1968). Mattai *et al* (1959) also studied the crop potential productivity and energy conversion efficiency in semi-arid climates. The ecologist intrested in energetics is primarily concerned with the quantity of incident energy per unit area of agro-ecosystem or ecosystem and the efficiency with which this energy is converted by organisms into other form.

Effective energy use in agriculture is one of the conditions for sustainable agriculture production, since it provides financial savingd, fossil resources preservations and pollution reduction (Ozkan *et al* 2004). Energy analysis are required for agricultural production in terms of its development and growth. The