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Study of Energy Flow on Apple Gardens in West Azerbaijan Province

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Abstract. Study of energy flow in ecosystem, especially in ecosystems that which are directly managed by human, is of great importance, because energy is flow of an ecosystem. Human could increase the efficiency of energy in agricultural products by applying management.In this survey the flow of energy in apple gardens of West Azerbaijan province ecosystem was calculated by using the statistics and information derived from agriculture (government) organization and providing of questionnaire from gardens of the province in 2009.Data's related to input and output are transferred to the rates equivalent to energy consumed and produced and then average energy was calculated (rate of output to input).The rate of applied energy is 11018330Kcal/ha and rate of produced energy is 10700 Kcal/ha, also rate of energy efficiency is 0.97. The result of this survey showed that main part of energy used in this product respectively consists of irrigation, chemical fertilizer and insecticide respectively.

We Could decrease energy efficiency by using drip irrigation systems, manure, insecticide, and pesticides considering to notice reduce the incidence of pests and diseases and so pace toward sustainable agriculture and decreased environmental pollution.

Keywords: Energy, apple, ecosystem, input and output.

INTRODUCTION

Study of energy flow in ecosystems especially in ecosystems that are managed by human is of great importance (or is significant), because indeed energy consists currency of an ecosystems.

In spite of the increase in the function of consumption of fossil energies in agriculture and other food production systems has caused a reduction(frequently operation increase in area measure and total production, naturally, in the efficiency of the use of energy comparing with traditional systems that are only dependent on human or animal force.

Agro ecosystems are depend on two inputs thoroughly different energy, namely ecological energy including radiant energy of photosynthesis, control of environment and establishment of atmospheric energy and raining production , generally requirement of cultivation energy in agriculture depend on the degree variation that gives in its natural.

Average radiant energy efficiency in different world ecosystems is reported less than %1, however, this grade for agro ecosystems is more reported but in the highest conditions is not more than %5. Consumption of fossil energy in agriculture increase the production biophysical analysis and energy of a agro ecosystem is necessary in order to make on effective production and efficiency.

Human could increase energy efficiency in agricultural production by applying management if the farmers productivity in developing countries ,in average is %40 as much as the productivity of farmer in undeveloped countries, this matter has not been possible in developing countries except by high consumption of energy.

Energy efficiency of agricultural production system could determine through equivalent operation productive energy and equivalent totally inputs energy and using cultural operations.

In this survey ,energy efficiency on apple gardens in Azerbaijan province evaluated and with the use of statistics and information of agriculture government organization of province , efficiency agents in decrease and efficiency in this culture are determined.

Materials and methods: Data's are gathered by providing of a questionnaire and by gathering information from the province farmers of by agriculture government organization and from this dates took average then average of dates indicates by using of relative formula and rate of energy each unit basically kcal/ha thus energy of each input and output is determined.(table1)

Tab. 1

Consumption and production energy on apple gardens in West Azerbaijan provinc.

Input and output energy	Rate of in hectar	Energy in unit kgr	Kiloculeri in hectar
consumption			
labor	1024	465	476160
manure			
urea	115	17600	2024000
potash	94	1600	150400
phosphate	24	3190	76560
poisons=pesticide			
insecticide	15	86910	1303650
fungicide	16	46910	1038560
irrigation	5949000	1	5949000
total=calculate			11018330
productive energy			
fruit yield(operation)	20000	535	10700000

Tab. 2

Energy efficiency by estimation of fruit operation (yield) and percentage of its compound.

	Percentage	Energy in each gram(kilo calorie)	Amount in hectare(kg)	Energy in per hectare kcal	Relatives of consumption energy to productive
water	8.82	0	0		
protine	.2	4	40	160000	35.68
lipid	.6	9	120	1080000	5.28
carbohydrate	14.1	4	2820	11280000	0.5
fibre	1.0	0	0		
ash	.3	0	0		
Mineral material	1	0	0		

Numbers in hectare=percentage of * yield/100
Energy in hectare= numbers in hectare * energy in each gram

Tab. 3

Energy efficiency on apple gardens in West Azerbaijan province.

production	Production energy	Consumption energy	Energy efficiency
fruit	10700000	11018330	0.97

RESULTS AND DISCUSSION

The results of this study indicate that the rate of energy efficiency in this product has been 197. Namely in recognition of consumption of one unit of energy about 0197 energy unit is produced.

Main part of consumption energy in this product respectively consists of water of irrigation, chemical fertilizer n2,and insecticide Toxics and fungicide that could decrease energy by using of drop irrigation systems and manure ,insecticide, pesticide considering to notice reduce the incidence of pests and disease and so pace toward . Sustainable agriculture and the protection of environment.

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