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Introduction

During the recent years, it has been observed in Western Countries that, as the carbohydrate food consumption decreased, the rice consumption has increased. The data show, that the annual per capita rice consumption in Turkey is almost 5 kg in recent years whereas it was *2,5* kg in the year 1961. For recent years per capita consumption has been estimated over 5 kg. Considering the current rapid population increase and the rising per capita consumption pattern, Turkey will need to higher its rice production or has to import more rice in future. The food consumption behavior of the oil rich countries in the Middle East has changed faster in favor of rice and rice import demand of them has increased many folds over the last decade. On the other hand EU countries are importing mostly corn and rice as field crops.

Upon these facts, Turkey has to increase her rice production for self-sufficiency and for expanding export goods.

I – Physiological aspects of rice for multiple cropping

Optimum and critical temperature, prevailing during the rice growing period, limits the rice growing area, sowing dates and culturing methods. According to Nishiyama (1976), there are two temperatures, limiting rice cultures. The lower edge of critical temperature during germination period is 15°C, whereas optimum temperature ranges between “18°C to 33°C”. The other highly sensible period is flowering stage, for which lowermost and the uppermost limits are 15°C-35°C respectively.

II – Ecological potential

Out of 80 provinces of Turkey, fifty are involved in rice growing. They can easily grouped into four different macro ecological region:

1. Mediterranean region
2. Aegean region
3. Marmara and Thrace
4. the others

The comparison of these four different macro ecological regions on physiological criterion might lead us to a scientific resolution. For this purpose it has been selected one station from each region and there meteorological data have been evaluated:

In the Mediterranean region, optimal temperature for germination reaches in the first week of April, whereas the temperature never falls below the critical value, not earlier then 10. of September twenty

years observations indicate that, this region has **153 days** from sowing to flowering without any danger of facing critical temperature during the heading stage. Adding to 40 days for ripening, this period seems to be more then 6 months.

In the Aegean region the mentioned period start from April and end in the first weak of September, leaving **140 days** from sowing to the flowering.

In the Marmara region, temperature reach to 18°C in the first weak of May and leaving only **110 days** favorable for rice culture period; because critical point starts in the 20-th of August.

In the Black Sea Coastal region, climatic factors are facilitating only ***105*** **days** risk free rice growing period.

III – Multiple growing systems in different regions of Turkey

1. Mediterranean region

In this region the following systems are in use or can be applied:

- Traditional rice farming;
- Second crop after wheat or barley of short duration And the following systems may be applicable;
- Second crop after wheat or barley of long duration and high quality “indica X japonica”s and high yielding japonica’s by transplanting method;
- Short duration cultivars + ratoon cropping;
- Medium duration cultivars transplantation's cropping + ratoon cropping;

Some research findings have already proved, that ratoon cropping is possible in Aegean region, where rice growing period 10 days shorter then Mediterranean. But putting this into the action, some more agronomic studies seems fulfilled. As it is known, rotooning is double harvest from the same. And this system is in praxis; in southern states of USA.

2. Aegean region

Because rice growing period in this region only 10 days shorten is, it seems to be possible to undertake all alternatives for Mediterranean Region except 1.3 item given above, which had been experimented in did not give any positive result in this region.

3. Marmara region

Rather shortened “rice growing period" is facilitating only traditional rice farming with short and medium duration cultivars. Second cropping of rice after barley or wheat with transplanting seems to be an other production alternative. Some research results seem to be possible.

4. Northern regions

Short or medium duration varieties are grown here, with traditional broadcasting. Second cropping is not a question due to rather short rice growing period". But with a research result started application is, that

after rice, come here barley as second crop of the year. So-wing of barley is done onto the rice fields without tillage.

5. Southeastern regions

High temperature during flowering stage of lens (upper limit is 35°C). So in this region high yielding and late flowering japonica's or high quality indica X japonica's should the main cultivars for future. On the other hand improving of high temperature resistant varieties during flowering seems to most important project for this region. As it has been planed 40.000 ha of rice acreage has been foreseen for GAP (Southeastern Anatolia Project).

IV – Research considerations

Some of the above mentioned production models have started after local experiments. For example second crop-application is a result of TOPRAKSU' (Soil and Water Research Institute's (Menemen)) experiments. And "RICE + BARLEY" system has been applied upon a project. Ratooning has been a research object in Ege University for a long time.

Agronomic studies are aiming, increasing the resource-use efficiency of a given crop. Therefore efficient utilization of physical resources are not considered. So to increase the efficiency of a given quality and quantity of a physical resources crop production needs a special research program, which may called as "cropping research systems".

On the other hand improving new varieties may extent multiple cropping systems to the other micro ecologies and also some other models can be effective with improving tailor-made cultivars.

Such a wide variation of ecological periods in Turkey, emphasize that for a specific sowing date and for a specific growing model for every micro ecological region **a specific variety should be improved**. But in the year 2000 the Turkey has only 14 rice cultivars in seed multiplication program. Unfortunately they are bold – Japonica types and most of them have completed their life.

So it seems to be indispensable to release adequate cultivars suitable to the specific growing models for every micro ecological region, with high performances.

Such a width spectrum research attempt can be fulfilled by international collaboration. But the results might be useful to all temperate regions. In Italy rice culture carried on only one macro ecology (Poo valley). But number of released varieties is more than 100. Where as Turkey has numerous rice growing conditions and has too limited number of rice cultivar.

In the Turkish rice seed market the private sector has the lions share (%80). But again the number of released varieties is limited. And they belong mostly to public sector.

The most interesting aspect of rice breeding activities is that almost all released varieties belong to the public sector except Dr. Tarsa's few preliminary released varieties. Being on the way of privatization for Turkey this mean that investment of private rice seed companies should be encouraged.

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