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from 1961 onwards they gradually replaced all the F.C.V. tobacco varieties so far under cultivation. With the increase in the tempo of activities of the different sections at the Institute a number of useful findings such as deep ploughing in summer, supply of pure seeds and seedlings along with plant protection recommendations, band placement of fertilizers, improved methods of curing and topping the crop had started to help the responsive Andhra farmer to reap bumper harvests till 1966. The slight decrease in the productivity in 1966-67 and 1967-68 could be mainly attributed to vagaries of the climate such as drought and cyclonic conditions during the crop seasons. By and large it may be inferred that the stagnation point was reached during this period. To overcome these conditions two new varieties *Kanakaprabha* and *Dhanadayi* were released in 1970 by the Central Tobacco Research Institute to boost up the production and the productivity in the traditional black soils and the newly exploited light soils.

During the twenty-year period under study the area and production had shown a tremendous increase of 114 per cent and 135 per cent respectively. But the increase in the productivity was only 11 per cent for which the important reason could be, as mentioned above, bringing in marginal lands under tobacco production, vagaries of the weather and cultivation of unapproved varieties, etc.

The present study reveals that the production of F.C.V. tobacco is closely linked with many variable factors, particularly the seasonal conditions and that the Central Tobacco Research Institute, Rajahmundry has made substantial contribution during the past 20 years for the improvement of this crop. Further improvements may be achieved by intensifying the research activities under different agro-climatic conditions and passing on the recommendations effectively to the tobacco farmers through the extension agencies.

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RICE DRYING PROBLEM DURING RAINY SEASON IN BANGLADESH†

Bangladesh is an important rice producing country. Rice is grown and harvested almost round the year throughout the country; this has particularly become possible with the introduction and rapid expansion of the cultivation of IRRI strains in the country.

The most prevalent practice of drying paddy in the country is the age old method of sun-drying in open yard. During the monsoon or rainy

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† This paper is prepared based on the report, *Aus Rice Drying in Bangladesh (A Case Study)*, Miscellaneous Report No. 3, Department of Co-operation and Marketing, Bangladesh Agricultural University. This study is an observational study that suffers from sufficient limitations.

season most of the days it rains or the sky remains cloudy in Bangladesh and adequate sunlight is not available for drying paddy. Whereas, the quality of rice starts deteriorating unless drying or aeration is not started within 48 hours after harvesting. Hence, drying is the important problem for the paddy that is harvested during rainy season in the country.

Aman, *Boro*, and *Aus* are the three seasonal rice crops in Bangladesh. *Aman* is harvested during winter or dry season. *Boro* is harvested just before the monsoon or rainy season starts. It produces about 14.5 per cent of the national rice production. Sometimes, in some areas its harvesting is delayed and extended to May, the early period of the monsoon. *Aus* rice, which produces about 24 per cent of the national total rice production, is harvested during mid-June to mid-August in rainy season and, thus, faced with severe drying problem.

Aus is grown in most of the districts of Bangladesh. The monthly rainfall in the major *Aus* growing districts averages 17.5" during June to August (1) It rains about 17 days a month during that period (2) Therefore, at least 24 per cent of the nation's rice production actually have been facing the drying problem and resulting quality and quantity losses in the absence of any mechanized or controlled drying method.

Observations of the detail weather situation and available drying hours, during the *Aus* harvesting period at Mymensingh and Feni, two *Aus* growing centres, reveal the acuteness of the problem. During the period on an average only 3.76 hours and 3.83 hours per day were available for drying paddy respectively at Mymensingh and Feni.

TABLE I—WEATHER SITUATION AND AVAILABLE DRYING HOURS AT TWO AUS GROWING CENTRES IN BANGLADESH: 1970 CROP YEAR

Particulars	Mymensingh (June to August)	Feni (July, 7 to August, 11)
Sunny days	11	N.A.
Partly sunny days	30	N.A.
(a) Rainy and sunny	3	
(b) Cloudy and sunny	20	
(c) Rainy, cloudy and sunny	7	
Days without sunlight	51	NA
(a) Completely rainy	1	
(b) Rainy and cloudy	39	
(c) Cloudy	11	
Effective drying hours available per day*	3.76	3.83
(a) Under sunny sky	3.37	3.30
(b) Under cloudy sky (aeration effect)	0.39	0.53

Source : See reference No. 3.

* In Bangladesh, harvested green paddy requires 2 to 3 full sunny days for being dried down to safe storage level (1). This may be estimated to be 17 to 26 effective drying hours. The drying hours here have been estimated on this basis. The estimations are made by guesses and eye estimations by the farm managers.

The harvesting period of a commercial farm, with 30 acres of *Aus* land at Feni, was 25 days from the 7th to the 31st July, 1970. The farm suffered a loss of about Rs. 965 or 9 per cent of the commercial value of the total production for consumption purposes, due to loss in quality and grade of about 49.4 per cent of its total production due to drying bottleneck. In terms of seed, inadequate drying facilities for this crop result a greater problem. The farm in point found about 54 per cent dried paddy unfit or seed.

TABLE II—ESTIMATED LOSSES DUE TO DRYING BOTTLENECK ARISING OUT OF BAD WEATHER IN A FARM AT FENI: 1970 CROP YEAR†

Particulars	Due to delayed threshing*		Due to delayed drying		Total**	
	Quantity affected (mds.)	Value lost (Rs.)	Quantity affected (mds.)	Value lost (Rs.)	Quantity affected (mds.)	Value lost (Rs.)
Partial loss due to loss in quality	30	60	236	905	266	965

Source : See reference No. 3.

† Estimations are made by guesses and eye estimations by farm manager.

* Drying bottleneck is reported to be primarily responsible for delayed threshing. But it also causes delay in harvesting and resulting losses due to shattering.

** Total production is 538.5 maunds with estimated commercial value of Rs. 10,770 for consumption purposes.

This nature of the situation suggests for using some mechanical or controlled method of drying to minimize these critical losses of paddy harvested during rainy season in Bangladesh. It should be a manually operated small drier suitable and economical for operation in rural areas by medium and large farmers. The farmers in that case may profitably use the drier for partially drying the paddy during bad weather and hold them to be completely dried in sunlight during fair weather.

Research in this field for developing and devising economically suitable rice drier is highly essential without further delay.

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