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VIABILTY OF WHEAT SEED PRODUCED FROM DIFFERENT SEEDING METHODS ON HIGHLANDS UNDER IRRIGATED CONDITION.

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ABSTRACT : Studies were conducted in order to define effect of different seeding methods on seed viability of wheat grow in highlands under irrigated conditions. The Experiment was conducted at two locations, Khun Pae and Kae Noi Stations. Seed quality was not significantly influence by seeding methods of drilling, hilling and broadcasting. Regardless of method and location, wheat seed maintained their qualities in terms of germination and moisture content. Storing seed in paper bags under ambient conditions for 7 months provided the good germination rate of 78%. Atmospheric relative humidity was the major factor responsible for increase and decrease in moisture content.

INTRODUCTION

As most wheat is produced on dry land, the availability of moisture is a major factor in production. The producting of wheat on irrigated field is still relatively uncommon in wheat growing areas due to the large areas planted by each producer. The utilization of irrigated rice paddy fields for growing wheat allows the provision of adequate moisture.

Seeding methods vary according to soil moisture and soil type. Broadcasting is practiced in areas where either wet ground limits access to the field, the ground has been planted into heavy stubble, or extremely large areas must be sown rapidly. Broadcasting normally fails to bring seed into close contact with soil moisture and so germination is low and poor stands result in reduced yields. Seed drills, however, can plant at a precise uniform depth with accurate row spacing and controlled seeding rate. It has been consistently shown that yield increases markedly if crops are seeded with drills that yiled increases markedly if crops are seeded with drills (Kiesselbach *et al*, 1934). The average yield of winter wheat from furrow drilling has been higher than that from surface drilling (May and McKee, 1925). Hill planting is relatively uncommon.

Seeding method indirectly affects seed quality. An unsuitable seeding method leads to inadequate moisture availability. Moisture stress during flowering can cause pollen sterility. Moisture stress after pollination during caryopsis development causes plant to develop pinched or shriveled kernels which results in a low quality seed crop.

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Implementing the three different methods of seeding was therefore required for discovering that method which produces the highest quality wheat seed in irrigated highland rice field.

METERIALS AND METHODS

The experiment was conducted under irrigated condition at two different highland locations, namely Khun Pae and Kae Noi Station. Khun Pae Station is located in the south of Chiang Mai province at an altitude of about 1,200 metres above sea level. Soil condition was judged to be of a moderate fertility level. Kae Noi Station is located in the north of the same province at an altitude of about 1,000 metres. Soil condition was classified as low to medium fertility level.

The three seeding methods of drilling, hilling and broadcasting were used. After harvesting, threshed seed were cleaned and dried to an approximate 10% moisture content. Three kilogram of the seed form each replication were then kept in paper bags under ambient condition at the Seed Laboratory, Department of Agronomy, faculty of Agriculture, Chiang Mai University for 7 months (April 1988 to November 1988)

Samples of seed were taken at the beginning of storge and thereafer every month for a standard germination test and moisture content determination. The experimental data were statistically analyzed using a completely randomized design with 3 replications and Duncan Multiple Range Test (DMRT) for the comparison between treatment means.

RESULTS AND DISCUSSION

The results of standard germination test and moisture content determination of the wheat seed from the 3 different seeding methods during the 7 months of storage are presented below:

Germination Test

The germination percentages of the wheat seed resulting from the 3 different seeding method are shown in Table 1 amd 2. The germination percentages of seed in both locations and from all 3 seeding methods were found to be not statistically different. The storing of wheat seed for 7 months presented no difficulties as their viability decreased relatively slowly and slightly. There was an approximate 78% germination of the seed in both locations after 7 months storage.

Table 1. Germination percentages of wheat seed using different seeding methods under irrigated conditions at Kae Noi Station.

Methods of Seeding	Germination (%)[1]							
	OM[2] Apr 1987	1M May	2M June	3M July	4M Aug	5M Sept	6M Oct	7M Nov
Drill	96	95	93	93	93	88	85	78
Hill	94	93	94	88	90	86	84	78
Broadcasting	95	92	93	89	90	85	83	80
F-Test	NS	NS	NS	NS	NS	NS	NS	NS

1 Average of three replications

2 Storage month

NS = Non-Significant

Table 2. Germination percentages of wheat seed using different seeding methods under irrigated conditions at Khun Pae Station.

Methods of Seeding	Germination (%)[1]							
	OM[2] Apr1987	1M May	2M June	3M July	4M Aug	5M Sept	6M Oct	7M Nov
Drill	96	96	95	93	90	89	89	79
Hill	97	96	94	94	94	93	88	78
Broadcasting	97	97	94	91	90	85	83	76
F-Test	NS	NS	NS	NS	NS	NS	NS	NS

1 Average of three replications

2 Storage month

NS = Non-Significant

Table 3. Moisture content percentages of wheat seed using different seed methods under irrigated conditions at Kae Noi Station.

Methods of Seeding	Moisture Content (%)[1]							
	OM[2] Apr1977	1M May	2M June	3M July	4M Aug	5M Sept	6M Oct	7M Nov
Drill	9.74	8.66	13.12	12.93	15.25	14.24	14.36	13.55
Hill	10.56	8 71	13.12	12.89	14.28	14.79	14.16	13.41
Broadcasting	11.02	8.58	13.02	13.24	14.93	14.29	14.50	13.77
F-Test	NS	NS	NS	NS	NS	NS	NS	NS

1 Average of three replications

2 Storage month

NS = Non-Significant

Table 4. Moisture content percentages of wheat seed using different seeding methods under irrigated conditions at Khon Pae

Methods of Seeding	Moisture Content (%)[1]							
	OM[2] Apr1987	1M May	2M June	3M July	4M Aug	5M Sept	6M Oct	7M Nov
Drill	7.52	8.27	13.41	12.61	15.74	14.21	14.52	14.09
Hill	8.60	8.48	13.57	12.69	15.89	14.30	14.62	14.45
Broadcasting	7.95	8.77	13.49	12.79	15.95	14.53	14.56	14.24
F-Test	NS	NS	NS	NS	NS	NS	NS	NS

1 Average of three replications

2 Storage month

NS = Non-Significant

Since wheat iss a cereal plant the seed contain carbohydrates as the major storate substance. Carbohydrate food supply is known also that, its influence on seed viability is much less than on those containing oil. Thus, where storage conditions are not optimum cereal seed can survive better than other types of seed. In this experiment wheat seed provided the same results as just mentioned before.

Moisture Content Determination

Seed moisture content of seed in both locations showed no significantly different in effect between treatments (Table 3 and 4). The initial moisture content of all seeds before storage was approximately 10 %. Seeds stored under the ambient condition of the Seed Laboratory absorbed water until they reached equilibrium moisture contents (EMC). The level of EMC reached dependent on the month. In both locations in August, seed moisture content peaked at 15 % and then declined over the ensuing months. August later proved to have had the heaviest continuous rainfall. The relative humidily was higher then than for any other storage months. Despite this, the higher moisture content did not markedly affect seed viability After 7 months storage the wheat seed contained approximately 13-14% moisture content and still gave a satisfactory and good germination percentage.

CONCLUSION

Neither drilling, hilling nor broadcastion played a definitive role in determining seed quality. Seed longevity during storage also did not depends on planting method. Wheat seeds from all methods of planting maintained similarly quality in both locations in terms of germination percentage and moisture condition for 7 months resulted in the good germinagion percentage of 78 %. Atmospheric relative humidity was the major factor responsible for the increase or decrease in moisture content percentage.

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