Construction and Standardization of Knowledge Test to Measure the Knowledge Level of Farmers on Rice Crop Cultivation

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Study Protocol

ABSTRACT

A study was designed to develop a standardized test to measure the knowledge of rice farmers. Pertinent items covering every aspect of rice cultivation were collected with the help of subject matter specialists, progressive farmers, and scientists along with related literature. After getting

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experts opinion, items were subjected to difficulty index, discrimination index, correlation, reliability and validity. Items with 20-80 of difficulty level, items with 0.20-0.80 discrimination index and significant either at 1 percent or 5 percent level point in biserial correlation were selected and admitted to rice to measure knowledge level on rice cultivation. A total of 47 items were included in the final knowledge test to measure the knowledge level of farmers in rice cultivation.

1. INTRODUCTION

Rice (*Oryza sativa*) production plays a significant role in Indian economy as rice contributes major part of food security of nation and cash income of small and marginal farmers, as India accounts for 80% of small and marginal farmers [1]. Rice is considered one of the most strategic commodities for the world; not only linked with global food security but also closely connected with economic growth, employment, social stability and regional peace. The United Nations General Assembly, declared the year of 2004 as the "International Year of Rice", which has tremendous impact on food security globally. Rice output has increased substantially since 1960, from 200 million tonnes to 499.31 million metric tonnes in 2019-20. China (29.39 percent of global production), India (23.63 percent of global production), and Indonesia are the top three rice producers (7.31 percent of world production). 90 percent of worldwide rice production and consumption takes place in Asia (IRRI, 2013). Rice is mostly grown in Asia in nations such as India, China, Bangladesh, Philippines, Sri Lanka, Vietnam, and Myanmar. In terms of area, productivity, and consumer choice, rice is one of India's most important food crops [2]. In India, area under rice cultivation is 43.82 million hectares with 112.44 million tonnes of production and the average productivity is 2566 kg ha -1. In India rice accounted 43.78 million hectare area coverage among all cereals and 118.43 million tones production with 2705 kg/ha productivity during 2019-20 [3]. For the welfare of farming community, the Indian government has introduced several strategies to support farmers such as new technologies, farm practices, and financial institutions and policy reforms. Ultimately the efforts of farmer are more important as he is investing his time, energy, money and intellect. Still the rice cultivation is not giving remunerative returns to the farming community and resulting in dissatisfaction among the rice farmers under different geographic and demographic sorts of rice farmers.

English and English [4] defined "Knowledge as the body of understood information possessed by an individual or by a culture". They further explained knowledge is that part of person's information which is in accordance with established fact. Konsam and Sakthivel [5] revealed that more than fifty per cent of the paddy growers had medium level knowledge, whereas more than one-fourth of them had low level of knowledge and less than one-fifth of them had high levels of knowledge about the recommended paddy technologies, respectively [6]. revealed that the two third of rice growers had medium (60.00%) knowledge level with respect to recommended cultivation practices of rice, followed by high (20.86%) and low (19.67%) knowledge level. Rufaida et al., [7] observed that only 21 per cent of the rice farmers had high level of knowledge, 35 per cent had lower level of knowledge and about 44 per cent of the rice farmers had medium level of knowledge. Knowledge and adoption of new technologies and bridging the yield gap could improve not only the production but also the efficiency of rice productivity. It has become imperative to develop an effective and holistic system of tackling lower production, productivity and marketing problems along with management of pests and diseases to make it more environmental friendly, economically viable and socially acceptable to farmers, which can be achieved through ecofriendly technologies. Technical knowledge is an important factor in determining the adoption of improved crop management practices and increased yields. Knowledge is one of the important components of behavior and as such plays an important role in the covert and overt behavior of an individual. Transfer of knowledge intensive technologies has to receive priority for bridging of knowledge gaps can bridge yield gaps. Therefore, the study was designed to develop a standardized test to measure the knowledge of the farmers in rice cultivation. The developed knowledge test was compressively covered all the critical components in rice cultivation so as to assess the realistic knowledge of the farmers in rice cultivation.

2. METHODOLOGY

Considering the importance and impact of rice cultivation on Indian economy, a knowledge test was developed by employing the following methodology and standardization of the test items given below.

A. Collection and Framing of Items

A comprehensive list of knowledge questions on rice cultivation in the study area were prepared by consulting the scientists of RARS (Maruteru), RARS (Nandyala) , ARS (Nelloru) ARS (Bapatla) and KVK (Amadalavalasa) of Acharya N.G. Ranga Agricultural University, Lam, Guntur, Andhra Pradesh. In addition to this, books, magazines and journals were also referred. Finally, 60 items were selected after careful scrutinized & editing to develop standardized knowledge test.

i. Selection of items for item analysis:

The criteria used for selection of items were,

1. Response to items should promote thinking than routine memorization
2. They should differentiate the well-informed respondent from less informed and should have certain difficulty value.
3. The items included should cover all areas of knowledge about rice cultivation.

By using above criteria, 60 items were selected for developing knowledge test, after editing carefully and by subjecting them to expert's endorsement as given in the Appendix-I. The experts consisted rice scientists and extension specialists progressive farmers of national wide.

ii. Form of items

The items selected for the construction of knowledge test on rice cultivation were framed in the objective form *viz.,* multiple choice, fill in the blanks, true or false and yes or no type. The particular types of questions were furnished in the Appendix-I.

iii. Pre-testing

Pre-testing of the items was done as suggested by [8]. The items selected for the knowledge test were pre-tested separately by administering the items to 90 rice farmers. Care was taken to see

that 90 respondents for this purpose were outside the main sample selected for the study.

B. Item Analysis

Item analysis was carried out by administering the pre-tested items to 90 rice farmers from non-sampling area. The item analysis was carried out as per the standard procedure, so as to yield three kinds of information *viz.,* "index of item difficulty", "item discrimination index" and "point biserial correlation". The index of the item difficulty reveals how difficult an item is, whereas discrimination index indicates the extent to which an item discriminates the well-informed rice farmer from the poorly informed. The point biserial correlation provides information on how well an item measures or discriminates with the rest of the test items.

The data thus obtained was subjected for typical item analysis. To analyze 60 items each of the ninety respondents to whom the test items were administered was scored on the basis of the score allotted *i.e.,* '1' for correct response and '0' for incorrect response. After computing the total score obtained by each of the ninety respondents on 60 items, they were arranged in order, from highest to lowest. These ninety respondents were then divided into six equal groups, arranged in descending order of total scores obtained by them. These groups were labeled as G1, G2, G3, G4, G5 and G6 respectively with fifteen respondents in each group. For the purpose of item analysis, the middle two groups G3 and G4 were eliminated keeping only four extreme groups with highest and lowest scores. The data of correct responses for each of 60 items were tabulated for each of these four groups [9].

After getting the four extreme groups for item analysis, the responses for each of the items were subjected to calculate difficulty index, discrimination index and point biserial correlation as given below.

i. Item difficulty index (P): The item difficulty index for each of 60 items was calculated as the percentage of the rice farmers answering an item correctly. The items with values ranging from 20 to 80 were considered for the final selection of the knowledge test. Difficulty index was computed by using the following formula and presented in the Table 1.

Table 1. Difficulty index, discrimation index, point biserial correlation and t values for knowledge test items on rice cultivation

Item No	Frequency of correct answers in the groups G1, G2, G5 and G6				S1+S2	S5+S6	Total frequencies of Correct answers by all Six groups	Difficulty Index	Discrimination Index ($E^{1/3}$)	Point Biserial Correlation (r pbis)	t values
	S1	S2	S5	S6							
1.	4	3	2	2	7	4	11	0.733333	0.3	0.396	2.2820**
2.	2	3	1	2	5	3	8	0.47	0.20	0.369	2.1008*
3.	4	2	3	1	6	4	10	0.53	0.20	0.356	0.3774*
4.	4	2	3	1	6	4	10	0.56	0.20	0.512	0.3571**
5.	4	4	3	2	8	5	13	0.90	0.30	0.095	0.5050(NS)
6.	4	2	2	1	6	3	9	0.53	0.30	0.521	0.5625**
7.	5	5	5	4	10	9	19	0.90	0.10	0.285	0.1111(NS)
8.	5	4	4	3	9	7	16	0.80	0.20	0.356	0.2500*
9.	4	5	4	4	9	8	17	0.90	0.10	0.149	0.7973(NS)
10.	4	3	1	1	7	2	9	0.77	0.50	0.419	2.4418*
11.	5	4	3	1	9	4	13	0.80	0.50	0.363	2.0614*
12.	4	3	1	1	7	2	9	0.47	0.50	0.378	1.0714*
13.	5	4	3	4	9	7	16	0.70	0.20	0.228	0.2857(NS)
14.	5	5	5	4	10	9	19	0.97	0.10	0.412	2.3926*
15.	4	3	1	2	7	3	10	0.57	0.40	0.415	2.4136*
16.	5	3	0	3	8	3	11	0.47	0.50	0.382	1.0714*
17.	3	5	2	0	8	2	10	0.53	0.60	0.491	1.1250**
18.	5	2	1	3	7	4	11	0.53	0.30	0.466	2.7869**
19.	5	3	4	2	8	6	14	0.70	0.20	0.356	2.0158*
20.	5	4	2	3	9	5	14	0.77	0.40	0.422	2.4631*
21.	4	4	1	2	8	3	11	0.57	0.50	0.44	2.5927*
22.	4	3	1	2	7	3	10	0.43	0.40	0.405	2.3439*
23.	5	5	1	2	10	3	13	0.60	0.70	0.613	4.1055**
24.	4	3	2	4	7	6	13	0.67	0.10	0.099	0.5264(NS)
25.	5	5	5	5	10	10	20	1.00	0.00	0.019	0.1006
26.	5	4	4	1	9	5	14	0.70	0.40	0.465	2.7793**
27.	5	5	3	2	10	5	15	0.77	0.50	0.279	1.5374(NS)
28.	4	5	3	2	9	5	14	0.73	0.40	0.423	2.4702*
29.	3	3	3	0	6	3	9	0.33	0.30	0.331	1.8561(NS)
30.	5	2	3	1	7	4	11	0.43	0.30	0.356	0.6923*
31.	5	4	1	2	9	3	12	0.53	0.60	0.475	1.1250**
32.	5	5	5	3	10	8	18	0.90	0.20	0.434	2.5491*
33.	4	4	1	4	8	5	13	0.73	0.30	0.512	3.1540**
34.	5	5	4	3	10	7	17	0.87	0.30	0.344	1.9386(NS)
35.	3	4	2	2	7	4	11	0.57	0.30	0.205	1.1083(NS)
36.	5	5	4	4	10	8	18	0.87	0.20	0.513	3.1624**
37.	3	4	2	1	7	3	10	0.43	0.40	0.415	2.4136*
38.	3	1	1	0	4	1	5	0.30	0.30	0.567	1.0000**

Item No	Frequency of correct answers in the groups G1, G2, G5 and G6				S1+S2	S5+S6	Total frequencies of Correct answers by all Six groups	Difficulty Index	Discrimination Index $(E^{1/3})$	Point Biserial Correlation (r pbis)	t values
	S1	S2	S5	S6							
39.	3	4	2	1	7	3	10	0.70	0.40	0.354	0.5714*
40.	4	4	3	2	8	5	13	0.70	0.30	0.45	0.4286**
41.	4	3	1	1	7	2	9	0.40	0.50	0.401	1.2500*
42.	4	2	0	1	6	1	7	0.40	0.50	0.563	1.2500**
43.	4	4	5	2	8	7	15	0.77	0.10	0.083	0.4407(NS)
44.	5	5	1	3	10	4	14	0.80	0.60	0.547	3.4576**
45.	4	5	2	2	9	4	13	0.63	0.50	0.453	2.6888**
46.	5	4	5	4	9	9	18	0.90	0.00	0.088	0.4675(NS)
47.	5	4	4	1	9	5	14	0.67	0.40	0.453	2.6888**
48.	5	3	5	4	8	9	17	0.80	-0.10	-0.039	-0.206(NS)
49.	4	2	1	2	6	3	9	0.47	0.30	0.372	2.1206*
50.	4	5	4	1	9	5	14	0.70	0.40	0.512	3.1540**
51.	5	5	5	3	10	8	18	0.93	0.20	0.348	1.9642(NS)
52.	4	3	2	2	7	4	11	0.43	0.30	0.426	2.4916*
53.	4	5	2	3	9	5	14	0.73	0.40	0.464	2.7717*
54.	4	4	1	1	8	2	10	0.47	0.60	0.567	3.6424**
55.	5	4	3	3	9	6	15	0.80	0.30	0.387	2.2209*
56.	3	4	0	2	7	2	9	0.47	0.50	0.364	2.0680*
57.	3	2	1	1	5	2	7	0.50	0.30	0.359	2.0353*
58.	5	5	4	4	10	8	18	0.90	0.20	0.378	2.1605*
59.	5	4	2	1	9	3	12	0.80	0.60	0.435	2.5563*
60.	4	5	3	4	9	7	16	0.87	0.20	0.402	2.3232*

Significant at 0.05 level   **Significant at 0.01 level*   *NS=Non-Significant*

$$\text{Difficulty index} = \frac{\text{number of rice farmers answered correctly}}{\text{total number of rice farmers}}$$

ii. Discrimination index (E $^{1/3}$): The second criterion for item selection was the item discrimination index. Discrimination index of each of the 60 items were indicated by 'E $^{1/3}$ ' and calculated by the formula.

$$E^{1/3} = \frac{(S1+S2) - (S5+S6)}{N/3}$$

Where S1, S2, S5 and S6 are the frequencies of correct answers in groups G1, G2, G5 and G6 respectively. N is the total number of rice farmers of the sample selected for items analysis *i.e.,* 90. The value of the discrimination index for the knowledge items with E $^{1/3}$ value ranging from 0.20 to 0.80 were considered for the final selection of knowledge test.

iii. Point biserial correlation (rpbis): The main aim of calculating point biserial correlation (rpbis) was to work out the internal consistency of the items *i.e.,* the relationship of the total score to a dichotomized answer to any given item. In a way, the validity power of the item was computed by the correlation of individual item of preliminary knowledge test calculated by using following formula.

$$r\, pbis = \frac{M_P - M_Q}{SD}\sqrt{PQ}$$

Where,

r pbis =   point biserial correlation coefficient
MP =   Mean of the total scores of the rice farmers who answered the item correctly   (or)

$$MP = \frac{\text{Sum of the total of XY}}{\text{Total no. of correct answers}}$$

MQ =   Mean of the total scores of the rice farmers who answered the item incorrectly   (or)

$$MQ = \frac{\text{Sum of the total of XY}}{\text{Total no. of wrong answers}}$$

SD =   Standard deviation of entire sample

p =   Proportion of rice farmers giving correct answer to the item

$$p = \frac{\text{Total no. of correct answers}}{\text{Total no. of rice farmers}}$$

q =   Proportion of rice farmers giving incorrect answer to the item
q =   1 – p

X   = Total score of the rice farmers for all items
Y   =   Response of the individual for the items
XY   =   Total score of the rice farmers multiplied by the response of the individual to the item.

Items having significant point bi serial correlation at 1% and 5% level were selected for final knowledge test and are presented in the Table 1.

C. Selection of the Items

Out of 60 items, 47 items were finally selected for knowledge test based on

1. Items with difficulty level indices ranging from 20 to 80.
2. Items with discrimination indices ranging from 0.20 to 0.80.
3. Items having significant point biserial correlation either at 1 percent or 5 percent level.

Thus, the finally selected knowledge items comprising 4 types of questions *i.e.,* multiple choice, fill in the blanks, yes or no and true or false, totaling to 47 items of test battery. The final knowledge test items selected for the test are given in the Appendix-II.

Administration of the test: The standardized knowledge test can be administered to any of the location specific geographical rice farmers to assess their comprehensive knowledge in rice cultivation.

3. RESULTS AND DISCUSSION

A total of 47 items were included in the final knowledge test to measure the knowledge level of farmers in rice cultivation. This study is a fundamental basis of rice cultivation. The actual result will be generated after considering the different index value of parameters.

4. CONCLUSION

The standard test conducted to measure the knowledge of farmers on rice cultivation is useful for the researcher to find out the number of items related to measuring the knowledge level of the rice farmers.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image

generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX-I

COMPREHENSIVE LIST OF QUESTIONS ON RICE CULTIVATION FOR ITEM ANALYSIS
(Please give the most appropriate answer for each of the following items)

1.   Any one recommended variety suitable for your area ---------------

2.   The recommended chemical for seed treatment in rice is ---------

3.   Seed treatment with ------------- is specifically recommended to control rice blast.

4.   Rice crop can be grown effectively under irrigated dry conditions also. (YES/NO)

5.   -------------causing most of damage in stored rice grains.

6.   Seed rate in rice is

A)   25-30 Kg/Acre   B) 30-40 Kg/acre   C)40-50 Kg/Acre

7.   Recommended dose of cartap hydrochloride granules is

A)   8kg/acre   B) 12 kg /acre   C) 4 kg/acre

8.   The quantity of Nitrogen present in 45 kg of urea bag is ------------

9.   Number of pheromone traps for stem borer is recommended per acre of rice

A)   8-10 /acre   B) 16-20/acre   C) 22-15/acre

10.   Total phosphorus should be applied as basal dose (YES/ NO)

11.   The use of potassium in rice cultivation is

A)   Enhances root growth B) Improves flowering C) Improves quality grain & resistance.

12.   Nursery area required for one acre of rice cultivation.

A)   5 Cents   B) 10 cents   C) 15 cents

13.   Recommended moisture percentage in rice

A)   13%   B) 16%   C) 20%

14.   Recommended Number of tillers per meter square in Kharif season

A)   33   B) 44   C) 66

15.   More number of seedlings per hill is recommended for late sown crop. (YES/N0)

16.   Appropriate stage for incorporation of green manure crop

A)   Just before flowering B) After 50% of flowering C) Above of the two conditions

17.   The quantity of Azotobacter is required to seed treatment for 1 kg of seed

A)   200-400 grams B) 400-600 grams   C) 600-800 grams

18.   Most suitable green manure crops for saline soils

A)   Dincha   B) Sun hemp   C) Cowpea

19.   Appropriate time of application of azolla

A)   In final puddling B) 10 -15 days after transplanting C) 45 days after transplanting

20.   Neem coated urea is having the advantage of

A)   Slow release of N B) Enriched in nutrient status C) Reduction in doses of N fertilizer

21.   Herbicide recommended for control of broad-leaved weeds in rice is ----------

22.   Select herbicide in rice applied after 10 to 15 of transplanting is ---------------

23.   The duration of rice crop from panicle initiation to harvest

A)   30 days   B) 45days   C) 60 days

24.   Commonly used non selective Herbicide is -------------

25.   The insect causes dead heart in rice is

A)   Root grub   B) Gandhi bug   C) Stem borer

26.   Summer ploughing helps in controlling of

A)   Stem borer   B) Aphids   C) Green leaf hoppers

27.   The quantity of neem powder is recommended to mix 50 kgs of Urea is

      A) 10 KGS   B) 20 KGS   C) 30 KGS

28.   White ear is the symptom of ---------------

29.   Optimum spacing for rice under modified SRI method is -----------

30.   Rope pulling across the crop is recommended to control ------------

31.   The incidence of -------------- pest is high under humidity conditions.

32.   ETL for leaf folder is

A)   I larva or 2 insects /hill B) 5 larva or 10 insects /hill C) 4 larva or 8 insects /hill

33.   ETL for BPH is

A)   20-25 hoppers/hill   B) 40-45 hoppers/hill   C) 60-65 hoppers/hill

34.   Seed rate required for drum seeder sowing ------------ per acre.

35.   The Chemical used for Seedling root dip method is--------------.

36.   Alley ways mainly useful to control

A)   BPH   B) Stem borer   C) Leaf folder

37. Optimum distance between alley ways.

A) 2m   B) 5m   C) 6m

38. To control stem borer incidence clipped leaf tips should be incorporated in the field. (Y/N)

39. Chemical which is used to control rats without pre baiting is--------

40. Quantity of spray fluid required for spraying in one acre of rice

A) 200 liters for knapsack sprayer B) 60-70 liters for power sprayer C) Above both

41. Monochrotophous is

A) Systemic insecticide   B) Contact insecticide   C) Fumigant

42. Improper bund cleaning leads to increase disease infestation. (YES/NO)

43. Application of FYM/ compost/ poultry manure will reduce the nitrogen application to the extent of

A) 20-25%   B) 30-40%   C) 60-70%

44. Spindle shaped spots is a peculiar symptom of -------------disease.

45. Drying of leaves from leaf tip across the margin a symptom of

A) BLB   B) Rice tungro   C) Rust

46. Complex fertilizer should not be applied as top dressing (YES/NO)

47. Rice tungro spreads through

A) Trips   B) Mites   C) Green leaf Hopper

48. 50 Kgs of SSP bag is having phosphorus content of

A) 8   B) 16   C) 32

49. Increasing the water level in field is recommended to control the sheath blight. (YES/NO)

50. Mixing of 3-4 chemical is highly effective in controlling different pest and diseases (Y/N)

51. The chemical used to control iron deficiency is -----------

52. Variety resistant to lodging-----------.

53. There should be a maximum water level in the field at the time of spraying. (YES/NO).

54. Appropriate time of spraying for control of pest and diseases is -----------

55. Number of Tricho gramma parasitoids recommended for acre

A) 20,000/acre B) 40,000/acre C) 60,000/acre

56. Recommended isolation distance for seed production in rice is

A) 3 m   B) 6m   c) 10m

57.   Do you the criteria to sell produce to the govt agencies   (YES/NO)

58.   Measures for stored grain pest in rice

a)   Disinfect gunny bags andflore&walls with malathoan
b)   Fumigate with aluminum phosphide tablets
c)   Above both conditions.

59.   Phosphatic fertilizer should not be mixed with zinc sulphate. (YES/NO)

60.   Yellow colour on pesticide labels indicates.

a) Danger   b) caution   c) poison

APPENDIX-II

STANDARDIZED KNOWLEDGE TEST TO MEASURE THE KNOWLEDGE OF FARMERS IN RICE CULTIVATION
(Please give the most appropriate answer for each of the following items)

RICE CULTIVATION:

1.   Any one recommended variety suitable for your area ---------------

2.   The recommended chemical for seed treatment in rice is ---------

3.   Seed treatment with ------------- is specifically recommended to control rice blast.

4.   Rice crop can be grown effectively under irrigated dry conditions also. (YES/NO)

5.   Seed rate in rice is

A) 25-30 Kg/Acre   B) 30-40 Kg/acre   C)40-50 Kg/Acre

6.   The quantity of Nitrogen present in 45 kg of urea bag is ------------

7.   Total phosphorus should be applied as basal dose (YES/ NO)

8.   The use of potassium in rice cultivation is

A) Enhances root growth B) Improves flowering C) Improves quality grain & resistance.

9.   Complex fertilizer should not be applied as top dressing (YES/NO)

10.   The chemical used to control iron deficiency is -----------

11.   Nursery area required for one acre of rice cultivation.

A) 5 Cents   B) 10 cents   C) 15 cents

12.   Recommended Number of tillers per meter square in Kharif season

A) 33   B) 44   C) 66

13.   More number of seedlings per hill is recommended for late sown crop. (YES/N0)

14.   Appropriate stage for incorporation of green manure crop

A) Just before flowering B) After 50% of flowering C) Above of the two conditions

15.   The quantity of Azaotobactor is required to seed treatment for 1 kg of seed

A) 200-400 grams   B) 400-600 grams   C) 600-800 grams

16.   Most suitable green manure crops for saline soils

A) Dincha   B) Sun hemp   C) Cowpea

17.   Appropriate time of application of azolla

A) In final puddling B) 10 -15 days after transplanting C) 45 days after transplanting

18.   Neem coated urea is having the advantage of

A) Slow release of N B) Enriched in nutrient status C) Reduction in doses of N fertilizer

19.   Herbicide recommended for control of broad-leaved weeds in rice is ----------

20.   Select herbicide in rice applied after 10 to 15 of transplanting is ---------------

21.   The duration of rice crop from panicle initiation to harvest

A) 30 days   B) 45days   C) 60 days

22.   The insect causes dead heart in rice is

A) Root grub   B) Gandhi bug   C) Stem borer

23.   Summer ploughing helps in controlling of

A) Stem borer   B) Aphids   C) Green leaf hoppers

24.   White ear is the symptom of ---------------

25.   Rope pulling across the crop is recommended to control ------------

26.   The incidence of -------------- pest is high under humidity conditions.

27.   ETL for leaf folder is

A)   I larva or 2 insects /hill B) 5 larva or 10 insects /hill C) 4 larva or 8 insects /hill

28.   ETL for BPH is

B) 20-25 hoppers/hill   B) 40-45 hoppers/hill   C) 60-65 hoppers/hill

29.   Alley ways mainly useful to control

A) BPH   B) Stem borer   C) Leaf folder

30.   Optimum distance between alley ways.

A) 2m   B) 5m   C) 6m

31.   To control stem borer incidence clipped leaf tips should be incorporated in the field. (Y/N)

32. Chemical which is used to control rats without pre baiting is--------

33. Quantity of spray fluid required for spraying in one acre of rice

B) 200 liters for knapsack sprayer B) 60-70 liters for power sprayer C) Above both

34. Monochrotophous is

A) Systemic insecticide   B) Contact insecticide   C) Fumigant

35. Recommended dose of cartap hydrochloride granules is

A) 8kg/acre   B) 12 kg /acre   C) 4 kg/acre

36. Improper bund cleaning leads to increase disease infestation. (YES/NO)

37. Spindle shaped spots is a peculiar symptom of -------------disease.

38. Drying of leaves from leaf tip across the margin a symptom of

A) BLB   B) Rice tungro   C) Rust

39. Rice tungro spreads through

A) Trips   B) Mites   C) Green leaf Hopper

40. Increasing the water level in field is recommended to control the sheath blight. (YES/NO)

41. Mixing of 3-4 chemical is highly effective in controlling different pest and diseases (Y/N)

42. There should be a maximum water level in the field at the time of spraying. (YES/NO).

43. Number of Tricho gramma parasitoids recommended for acre

A) 20,000/acre B) 40,000/acre C) 60,000/acre

44. Recommended isolation distance for seed production in rice is

A) 3 m   B) 6m   c) 10m

45. Do you the criteria to sell produce to the govt agencies   (YES/NO)

46. Measures for stored grain pest in rice

a) Disinfect gunny bags andflore&walls with malathoan
b) Fumigate with aluminum phosphide tablets
c) Above both conditions.

47. Do you able to understand labels in insecticides.   (YES/NO).