

## RESEARCH NOTE

## A Scale for Measurement of Management Efficiency of Grape Growers

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### ABSTRACT

*The present study was conducted in one districts namely, Nasik of Maharashtra State with sample size of 200 grape growers to measure their management efficiency. Ten components of management efficiency of grape growers namely, knowledge regarding management practices, information seeking ability, ability in planning, ability in co-ordinating activities, timely adoption, ability to make rational decisions, ability to mobilize resources, efficient use of resources, ability in rational marketing and competence in evaluation were selected based on relevancy weightage and scale value. The standard procedure was followed to develop the scale such as item/statement collection, criteria given by Edward (1969) to frame the statements, judges' response on items, item analysis, validity and reliability. It was observed that the scale values of components of management efficiency of grape growers i.e. knowledge regarding management practices, information seeking ability, ability in planning, ability in co-ordinating activities, timely adoption, ability to make rational decisions, ability to mobilize resources, efficient use of resources, ability in rational marketing and competence in evaluation were 8.73, 7.22, 6.14, 4.77, 4.44, 4.11, 3.97, 3.36, 2.70 and 2.27 respectively. It reveals that all the statements under components of management efficiency of grape growers were found to have highly significant. And also all the statements had relevancy weightage more than 0.75. Hence, the management efficiency scale was found to be standardized.*

**Key words:** Management efficiency; Grape growers; Rational decision making ability; Information seeking ability;

**G**rape is an important commercial fruit crop of India which contributes to the maximum share of export of fresh fruits and vegetables from India to Europe and other parts of the world. The country has exported 1,92,616.91 MT of Grapes to the world for the worth of Rs. 1,666.44 crores during the year 2013-14 (APEDA). So it become necessary to manage this crop very well. Management is directly related to production and indirectly socioeconomic development of farmer in society. In this context, it is felt necessary to develop scale for measuring management efficiency of grape growers. Management efficiency of grape growers is operationally defined as degree of knowledge of grape growers regarding management practices, information seeking ability, ability in planning, ability in co-ordinating activities, timely adoption, ability to make rational decisions, ability to mobilize resources, efficient use of resources, and ability in rational marketing and

competence in evaluation for better output.

### METHODOLOGY

The present study was conducted in Nasik district of Maharashtra with sample size of 200 grape growers. The scale on management efficiency of grape growers was developed by applying standard procedure which is mentioned as under. Collection of components based on review of literature on various measures of management efficiency and discussion with experts in the field of agricultural extension, horticulture, management experts, etc., ten components had been identified. These components were then mailed to 80 judges in the field of horticulture, agricultural extension, agriculture economics and management with a request to indicate the relevancy of each of the component listed in relation to management efficiency. The responses of judges were secured on three-point continuum namely,

'Most relevant', 'Relevant' and 'Not relevant' frequencies and scored as 2, 1 and 0, respectively. The responses received from 50 experts. These responses were used to work out the relevancy weightage (RW) of each component by using following formula.

$$RW = \frac{MR \times 2 + R \times 1 + NR \times 0}{100 (MPS 50 \times 2)}$$

Where

MR=Most relevant; R=Relevant; NR=Not relevant x 0  
MPS=Maximum possible score

Considering relevancy weightage, the components were screened for their relevancy. Accordingly, components having relevancy weightage more than 0.75 were considered. Thus, a total of ten components namely, knowledge regarding management practices, information seeking ability, ability in planning, ability in co-ordinating activities, timely adoption, ability to make rational decisions, ability to mobilize resources, efficient use of resources, ability in rational marketing and competence in evaluation were finally selected to develop management efficiency scale.

*Computation of scale value by normalized rank method:* The selected ten components were mailed to 80 judges for ranking. Responses were obtained from 50 judges out of 80 judges, which were considered for calculating scale values with the help of *Guilford's (1954)* normalize rank method.

*Collection and editing of statements:* The statements were framed on each component after reviewing the related literature and thorough discussion with the experts in the fields of horticulture and agricultural extension. A battery of 97 items was drafted. The statements were edited based on 14 criteria suggested by *Edward (1969)*. These statements were then subjected to scrutiny by an expert panel of judges to determine the relevancy. For this purpose, the statements were given to a panel of 120 judges and requested to indicate appropriateness (relevancy) of each statement for inclusion in the scale. The responses were obtained on three-point continuum viz., 'most relevant', 'relevant' and 'not relevant' with scores of 2, 1 and 0, respectively. Based on 50 judges' responses of these judge's relevancy percentage, relevancy weightage and mean relevancy score were worked out for all the 97 items individually, using the formulae given by *Edwards (1969)*.

*Relevancy percentage:* Relevancy percentage was worked out by summing up the scores of 'most relevant',

'relevant' and 'not relevant' responses and was converted into percentage.

$$\text{Relevancy (\%)} = \frac{MRR \times 2 + RR \times 1 + NRR \times 0}{100 (MPS 50 \times 2)} \times 100$$

*Relevancy weightage:* Relevancy weightage (RW) was obtained by the following standard formula.

$$RW = \frac{MRR \times 2 + RR \times 1 + NRR \times 0}{100 (MPS 50 \times 2)}$$

*Mean relevancy score :* The mean relevancy score (MRS) was obtained by the following standard formula.

$$MRS = \frac{MRR \times 2 + RR \times 1 + NRR \times 0}{\text{Number of judges (i.e. 50)}}$$

Where,

MRR = Most relevant response

RR = Relevant response; NRR = Not relevant response

Using these three criteria, the items were screened for their relevancy. Accordingly, items having relevancy percentage of more than 75, relevancy weightage of more than 0.75 and mean relevancy score of more than 1.5 were considered for final selection.

Final selection of the items made on the basis of item analysis. It was considered essential to delineate the items (statements) based on the extent to which, they can differentiate the person's management efficiency, for this purpose item analysis was carried out. The statements were administered to 40 grape growers from non-sample area. For item analysis, 't-test' was used. The respondents were arranged in ascending order on the basis of total score earned by them. Then 25 per cent respondents with highest total score and 25 per cent with total lowest score were selected. These two groups provided the criterion groups for item analysis. The critical ratio (t) for each item was calculated by using following formula.

$$t = \frac{\bar{X}_H + \bar{X}_L}{\sqrt{\frac{\sum(X_H - \bar{X}_H)^2 + \sum(X_L - \bar{X}_L)^2}{n(n-1)}}$$

$$\sum(X_H - \bar{X}_H)^2 = \sum X_H^2 - \frac{(\sum X_H)^2}{n}$$

$$\sum(X_L - \bar{X}_L)^2 = \sum X_L^2 - \frac{(\sum X_L)^2}{n}$$

Where, t = Critical ratio

$X_H$  = Mean score on a given statement for the high group

$X_L$  = Mean score on a given statement for the low group

$X_H^2$  = Sum of square of the individual score in the high group

$X_L^2$  = Sum of square of the individual score in the low group

n = Number of respondents in each group

The significance of the difference of the means of these two groups was found out by 't' test. The 't' value is the measure of the extent to which given statement differentiate between high and low groups. The 't' value equal to or greater than 1.75 indicate that the average response of high and low group differs significantly and differentiates between high and low groups. Finally, the statements having 't' value greater than 1.75 were selected.

*Reliability of the scale:* A scale is said to be reliable when it consistently produces the same results when applied to measure the same phenomenon from time to time. For this study test-retest method of reliability was used.

*Test retest method:* The management efficiency scale with items as developed was administered to the 20 grape growers who were neither previously interviewed nor had chance to come in the final sample. After period of 15 days the same 20 grape growers were given the test. Two sets of scale score were thus obtained. Each of the two sets of statements was treated as a separate scale and then these two sub-scales were correlated. The coefficient of reliability was calculated by the Rulon's formula which came to 0.9229. Thus, the scale developed was found highly reliable.

*Content validity of the scale :* It means the extent to which the items included in the test represent the total universe of the content. It was ensured while framing the items, which were collected from the available books, journals, relevant literature and through interviews with scientists, experts and progressive farmers. The content validity of the scale was ensured by selecting the contents

after discussion with specialists of extension and academicians at Mahatma Phule Agricultural University, Rahuri. The management efficiency was measured by getting the responses in terms of agree, undecided and disagree with regard to each of the 64 items included in the scale. The responses were collected in three-point continuum. Score 3 was allotted to 'agree' statements, 2 was allotted to 'undecided' and one score to 'disagree' response. Thus, the total score one could obtain ranged from 64 to 192 as 64 statements were included in final scale. The score for each respondent was obtained by summation of score of each one of the statements included in the scale. Considering the management efficiency score of the respondents, they were grouped into five categories on the basis of arbitrary method.

Category	Management efficiency (Score)
Very low	Upto 90
Low	Between 91 to 115
Medium	Between 116 to 141
High	Between 142 to 166
Very high	Above 166

## RESULTS AND DISCUSSION

The final format of the scale is given in Table 1. It was observed from Table 1 that the scale values of components of management efficiency of grape growers i.e. knowledge regarding management practices, information seeking ability, ability in planning, ability in co-ordinating activities, timely adoption, ability to make rational decisions, ability to mobilize resources, efficient use of resources, ability in rational marketing and

**Table 1. Statements of management efficiency scale with Relevancy weightage (RW), Relevancy per cent (R%) and Mean relevancy score (MRS)**

Major/Sub components	RW	R(%)	MRS
<i>Knowledge about improved cultivation practices (8.73)</i>			
Grape is grown in three distinct agro-climatic zones namely, subtropical, hot tropical and mild tropical regions in India.	0.75	75	1.50
The soils having pH range of 6.5 to 7.5 are ideally suited for grape cultivation.	0.79	79	1.58
The varieties namely Thompson Seedless and its clones namely Tas-A-Ganesh, Sonaka, Anab-E-Shahi, Sharad Seedless and Flame Seedless are suitable for cultivation in hot tropical region.	0.90	90	1.80
Berries of Sonaka Seedless variety are elongated, yellow coloured with thin skin.	0.80	80	1.60
Grape is normally propagated by stem cuttings obtained from matured canes after pruning of vines in October.	0.86	86	1.72
Soaking of basal ends of the cuttings in IBA 250 ppm solution for 15 seconds ensures better rooting of the cutting.	0.85	85	1.70
Increased irrigation during ripening (one month prior to harvesting) improves the quality of grapes and hastens ripening.	0.75	75	1.50

Training of grape facilitates operations like pruning, interculture, spraying and harvesting.	0.76	76	1.52
Flowering takes place when the minimum temperature is 20°C; the optimum range being 18.3°C to 22.1°C.	0.79	79	1.58
GA-3 is applied at pre-bloom stage to make the pollens non-functional	0.79	79	1.58
Hydrogen Cyanamide is used to hasten and increase the bud break winter pruning	0.81	81	1.62
Grapes should be harvested during cool time of the day	0.84	84	1.68
Mealy bugs on grape can be controlled by spraying of Dimethoate 1.7ml/lit of the water after pruning.	0.85	85	1.70
The grape boxes are stored at 0-1°C temperature and 90% to 95% humidity in cold storage for transporting by sea.	0.81	81	1.62
<i>Information seeking ability (7.22)</i>			
I do contact personal localite (friends, relatives, progressive farmers etc.) for seeking information on improved grape cultivation practices.	0.82	82	1.64
I do contact local cosmopolite sources (Agricultural Assistants, Gramsevak.) for seeking information on improved grape cultivation practices.	0.76	76	1.52
I do interact with the members of Grape Growers Association for seeking information on improved grape cultivation practices.	0.82	82	1.64
I do read the newspapers and farm publications for seeking information on improved grape cultivation practices.	0.81	81	1.62
I do access the information of grape cultivation on internet.	0.83	83	1.66
I do visit the research stations of Agricultural University and NRC for grape for seeking information on improved grape cultivation practices.	0.81	81	1.62
I do participate in the seminars, workshops, trainings etc on grape cultivation conducted by the government and non-government agencies.	0.88	88	1.76
<i>Ability in planning (6.14)</i>			
I do estimate the capital requirements for grape cultivation.	0.81	81	1.62
I do estimate the inputs required for grape cultivation.	0.82	82	1.64
I do identify the sources of input supply.	0.81	81	1.62
I do identify the sources of availability of quality root stock and scions.	0.82	82	1.64
I do locate the skilled persons for grafting.	0.88	88	1.76
I do prepare calendar of operations for grape cultivation.	0.80	80	1.60
I do estimate the labour requirements for grape cultivation.	0.83	83	1.66
I do select the trader/agency for marketing of grape.	0.81	81	1.62
<i>Ability in co-ordinating the activities (4.77)</i>			
I do clean the field by removing the weeds and other trash material and then apply organic and inorganic fertilizers.	0.86	86	1.72
Looking to the availability of irrigation water, I do irrigate the crop and adopt appropriate moisture conservation practices.	0.80	80	1.60
I do observe the crop for incidence of pest/diseases, seek expert guidance and follow the crop protection measures.	0.82	82	1.64
I do ensure the training and pruning of crop.	0.89	89	1.78
I do carryout harvesting, grading, packaging and marketing of grapes.	0.83	83	1.66
<i>Timely adoption (4.44)</i>			
I do apply adequate quantity of organic manures before establishment of vineyard.	0.92	92	1.84
I do apply recommended doses of fertilizers at proper time.	0.87	87	1.74
I do carryout training and pruning at proper stage.	0.85	85	1.70
I do irrigate the crop as per recommendation at proper time.	0.82	82	1.64
I do harvest the crop at proper time of ripening.	0.89	89	1.78
I do make timely arrangements for grading, packaging and storage of produce.	0.87	87	1.74
I do ensure the marketing of produce at proper time.	0.89	89	1.78

<i>Ability to make rational decisions (4.11)</i>			
I do select the variety based on the purpose (table/ rasin/ winery) and demand in market.	0.88	88	1.76
I do take decisions to avail the benefits of government schemes for coping up with natural disasters in consultation with extension personnel.	0.78	78	1.56
I do decide the traders or agents for marketing the grape based on their reputation and my past experience.	0.81	81	1.62
<i>Ability to mobilize the resources (3.97)</i>			
I do ensure the adequate and timely availability of fertilizers and manures.	0.81	81	1.62
I do ensure the adequate and timely availability of plant protection equipments and machinery.	0.85	85	1.70
I do ensure the adequate and timely availability of irrigation system and irrigation water.	0.82	82	1.64
I do raise the adequate capital before start of the season for managing the grape vineyard.	0.76	76	1.52
I do ensure the adequate and timely availability of skilled and unskilled labourers for different operations in grape vineyard.	0.78	78	1.54
<i>Efficient use of resources (3.36)</i>			
I do ensure the deployment of skilled and unskilled labourers for appropriate operations in grape vineyard.	0.88	88	1.76
I do ensure the economic use of inputs like fertilizers, chemicals and growth regulators.	0.82	82	1.64
I do use the irrigation water by following micro irrigation systems with proper irrigation interval.	0.90	90	1.80
I do make maximum use of farm machinery and tools to reduce the cost of production.	0.77	77	1.54
<i>Ability in rational marketing (2.70)</i>			
I do collect the information about various marketing channels available to sell the produce.	0.88	88	1.76
I do study the marketing practices followed at various markets.	0.77	77	1.54
I do select the market where my produce can be sold at competitive price and where fewer malpractices are followed.	0.85	85	1.70
I do follow proper grading and packaging practices to get maximum price to my produce.	0.89	89	1.78
I do prefer the cost effective transportation for my produce	0.80	80	1.60
<i>Competence in evaluation (2.27)</i>			
I do assess the soil health by carrying out soil analysis.	0.81	81	1.62
I do assess the quality of irrigation water by testing it in laboratories.	0.86	86	1.72
I do assess the efficacy of growth regulators by watching the vegetative growth and fruit development	0.76	76	1.52
I do assess the efficacy of crop protection measures by observing the reduction in pest and disease infestation.	0.80	80	1.60
I do assess the contribution of machinery in minimizing the cost of production by saving expenditure on labourers .	0.79	79	1.58
I do assess the performance of marketing strategy followed by me in terms of returns per hectare.	0.86	86	1.72

(Items with more than 0.75 relevancy weightage, more than 75 per cent relevancy per cent age and mean relevancy score more than 1.5 were considered for inclusion in the final scale.)

competence in evaluation were 8.73, 7.22, 6.14, 4.77, 4.44, 4.11, 3.97, 3.36, 2.70 and 2.27 respectively. It revealed that all the statements under components of management efficiency of grape growers were found to have highly significant. Thus all the statements having relevancy percentage of more than 75, relevancy weightage of more than 0.75 and mean relevancy score

of more than 1.5 were considered for final selection. Hence, the management efficiency scale was found to be a standardized and objective one, as indicated by the validity, reliability and norms of distribution scores. Therefore this scale can be used by all persons and organizations to measure the management efficiency of grape growers in objective way.

## REFERENCES

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