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A scale to measure knowledge of tribal women regarding vermiculture technology

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■ **ABSTRACT :** The study was conducted in purposively selected village 'Reechhawer 'of Udaipur district of Rajasthan state. A sample of 120 tribal women, one from each household, continousely using vermiculture technology, was considered for gathering required information. The results of the study indicated that finally, 47 statements were selected in the scale, having t – value more than 1.75.

■ **KEY WORDS:** Improved agriculture practices, Adoption, Rating technique

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The knowledge has direct bearing on the behaviour of the individuals. Therefore, the success or failure of any programme or practices would mainly depend upon the people's awarness and knowledge towards innovations (Vyas and Maheshwari, 2009). To find out the knowledge of the tribal women about vermiculture technology, a scale was developed.

Tool construction:

For developing the scale, summated rating technique as suggested by Likert (1932) was followed.

Item collection:

Sixty four statements on vermiculture technology were prepared on the basis of relevant literature, discussion with faculty member of the College of Home Science, Directorate of Extension Education and interview with tribal women. These statements were scrutinized following the fourteen informal criteria as suggested by Edwards (1957) and (Vyas and Maheshwari, 2009).

Item analysis:

The statements were presented to 120 tribal women and their agreement disagreemrent in five point continum was sought. The purpose of item analysis was to examine how well each item discriminates between persons having different level of knowledge on such criteria, items with good discrimanatory values were retained and others eliminated. The following steps as suggested by Edward were followed in the item analysis. The total score obtained by each person all the statements were calculated in the preliminary series. The various responses were assigned numerical weightage varying from 5 strongly agree, 4 agree, 3 undecided, 2 disagree and 1 strongly disagree for positive statements. Total score of an individual was the summation of numerical weight assigned to each response, on the basis of individual total scores. Twenty five per cent subjects with highest total scores and 25 persent of the subjects with the lowest scores were segregated and formed the criterion group for evaluation of individual statements for determining the relevance of a particular statement and eliminating those which did not discriminate well between persons holding different level knowledge.

In evaluating the responses in the high and low groups to the individual statements the following formula for't' ratio was used:

$$t = \frac{XH - XL}{SH^2/nH + SL^2/nL}$$

where,

XH =The mean score on a given statement for the high group

XL =The mean score of the statement for the low group

SH^2 =The variance of the distribution of responses of the high group

SL^2 =The variance of the distribution of responses of the low group

nH =The number of respondents in the high group

nL = The number of respondents in the low group.

The value of 't' is a measure to the extent to which a given statement differentiates the high and low groups, 't' equal to or greater than 1.75 was valid for measuring the knowledge. Keeping this criterion in view, 47 items (27 positive and 20 negative statements), which had't' value of 1.75 or above were finally. Thus, 47 itam were re-arranged by area and close ended as well as open ended with dichotomous and multiple responses, which are presented in Table 1. Similar methodology was also adopted by (Vyas and Maheshwari, 2009) and (Vyas and Maheshwari, 2011).

In all, there were 47 Question and the maximum possible knowledge score was 235 (Table 1).

Reliability was measured by split half and test – retest. The scores of 120 tribal women on two halves of the scale, were tabulated and co-efficient of correlation between the scores on the two halves of the same scale were found out. The value of r (+0.80) was significant at 0.01 per cent level. This indicated the internal consistency and reliability of the items in the knowledge scale.

The same groups of 120 tribal women were interviewed personally after at an interval of 15 days. The two sets of scores of these tribal women were tabulated and co – efficient of correlation (r-0.88) was found significant at 0.01 pre cent level. The validity of the scale was ensuared during the process of condtructing the scale. The scale was examined for the content validity by determining how well the content of the scale represented the subject matter under study. All the possible items covering the universe of content were selected by dicussions with experts, subject matter specialists and from all the available literature on the subject. Thus, the scale assured the content validity. The individuals total knowledge score will be calculated by summing up the scores obtained by each of the individual against all the items in the scale. Therefore, the obtainable score on the developed knowledge scale will range from a minimum of 47 to a maximum of a 235. The mean knowledge score of individual can also be worked out and mean score of less than 2.5 will indicate very poor knowledge and more than 3.5 will show the positive knowledge towards vermiculture technology, average scores ranging between 2.5 to 3.5 will indicate medium level. Similar results were also reported by (Vyas and Maheshwari, 2009 and 2011).

Conclusion:

The scale was found to be reliable and valid. Therefore, it would correctly measure the knowledge of tribal women towards nutrition practices to the maximum precision possible and can yield consistent results when used on different occasions involving the similar and or different subjects.

Table 1: Component wise distribution of statements and their scores

Sr. No.	Components	Questions/items	Maximum scores
1.	Concept	3	11
2.	Bed preparation	6	12
3.	Raw material and its pretreatment	7	27
4.	Earthworm	4	12
5.	Watering of bed	4	12
6.	Filling of bed	6	14
7.	Maintenance of bed	5	18
8.	Harvesting of vermicompost	5	17
9.	Care during transportation	1	05
10.	Uses and advantages	6	18
	Total	47	235

Table 2 : Final scale to measure knowledge of tribal women towards vermiculture technology

Sr. No.	Scale item	SA	A	UD	D	SD
1.	**Concept of vermiculture technology**					
	Vermiculture technology is a compost making technology.					
	This technology is different form other compost making methods in two ways, compost prepared by worms and compost ready within two months.					
	There is no need of bed with shade , raw material, earth worms and water in prepare the vermicompost.					
2.	**Bed preparation**					
	Bed should not be on raised platform.					
	Bed should have shade over it.					
	Bed should be near to water source.					
	The size of bed can not be changed as per our requirements.					
	While changing the size the depth of bed should not be changed for proper rotation of air in side the bed.					
	Plastering is essential for vermicompost bed before filling because it prevents earthwormes to penetrate nearby area in earth.					
3.	**Raw material**					
	We can use large ruffage, cereal straws, dry leaves, animal dung, fresh green leaves, etc. as raw material.					
	These materials can be used directly in the bed without any pretreatment.					
	Pretreatment of rawmaterial releases heat, material becomes softer.					
	Dung can be collected from those animals who are under treatment and straws from the crop treated with hazardous chemical or insecticide .					
	Soaking, sprinkling water, separating unwanted materials are the different methods of pretreatment of raw material.					
	One has to pretreat the raw material 3 – 4 days before filling the bed.					
	One can not judge by touching and smellings that raw material is fully treated and ready to fill in the bed.					
4.	**Earthworms**					
	A special variety of earthworms responsible for vermicomposting.					
	The special variety earthworms are not bio mass eaters, dark red in colour, 3" in length, 2-3 g in weight, surface dwellers /micro drilli.					
	One kg or 2000 earthwormsare needed for a bed to start with.					
	Leaf litters, agricultural waste, humus, waste paper, cotton cloths, dung, city Garbage, biocornpost/ slurry, weeds, wood powder industrial waste, vegetable peals, etc. are not the feed of earthworms.					
5.	**Water**					
	Water is not needed in preparation of vermicompost.					
	The role of water is to maintain temperature, humidity, protects earthworms from its enemies especially from white ant and ants.					
	Water should be clean (free from chemical contamination, insecticide, soap etc.).					
	Requirement of water is not changes according to season.					
6.	**Filling of bed**					
	Pretreatment of bed is not essential before filling the bed.					
	Pretreatment does not protect the bed from insects/ termite/ants/white etc.					
	The ratio of insecticide should be 5 drops of Kerosene or Malathion with 1 liter of water for pretreatment / bed.					
	Bed shoud be filled immediately after the pretreatment.					

Table 2: Contd……..

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	The process of filling bed is -first, damp the bed thoroughly, place the plastic sheet, layer of water soacked big straws ,layer of water soacked small leaves ,layer of water soacked dry leaves , layer of partially decomposed dung , layer of earthworms ,layer of partially decomposed dung , layer of dry leaves ,layer of green leaves, finally, cover the bed with dampgunny bags on the top.)
	We can add raw material in the bed daily.
7.	**Maintenance of vermi-bed**
	One has to perform daily watering, tillage after one month, weeding by hand time to time after filling bed once.
	Tillage is not necessary for proper aeration, water impercolation, leaching of water, prepared compost comes up and unprepared goes down, makes earthworms movement easier.
	Weeding is essential to restrict the absorption of all the nutrients from the composed, make easy movement of earthworms inside the bed.
	One year time is required in preparation of vermicompost in bed.
	Vermicompost is ready when earthworms come on surface of the prepared compost, vermicompost becomes black in colour, granular in form, odourless,non-sticky matter
8.	**Harvesting of ready compost**
	Stop watering over prepared vermicompost for 3-4 days; empty the bed, separate earthworms from prepared vermicompost.
	By sifter, hands, putting ready vermicompost in sublight one can separate the earthworms.
	One can expose ready vermicompost to sunlight more than 8 hour because sunlight does not damage earthworms, nutrients etc.
	Bed can be refilled same day or after 6 days with new raw material.
	No special care is needed in case of using earthworms after a gap.
9.	**Care during transportation**
	While transporting earthworms from one place to another, the mouth of the gunny bag or plastic bag should not be closed tightly, feed and water should be given to the earthworms during transportation.
10.	**Uses and advantages**
	Ready vermicompost can not be used in farms, nursery , as a basal doze, fruit/ vegetable plants, ornamental plants, kitchen garden, pots, for marketing as an income generatic activity
	Compost with earthworms can be used in fruits plants, in vegetable plants and for marketing as an income generatic activity.
	Earthworms only can be used in beds of roots and tubers vegetables, in medical therapy for treatment of wounds, piles, chronic boils, hernia, jaundice, respiratory ailments, pyorrhea, as a fever reducing agent, in confirmation of pregnancy ,for fishing ,for marketing etc.
	Vermicompost can not be stored for future.
	During vermicompost preparation, the raw material under process can not be used as a nursery bed (For paddy, fruit plant nursery etc.).
	Vermicompost is advantageous than ordinary compost. (Good quality compost, frtility, water impercolation, porousity and sponginess, water holding capacity of soil increases improves environmental sanitary conditions, recycles the domestic agricultural and rural and industrial waste.)

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