



## **Assessment of occupational health hazards of Floriculture Workers through Reba Technique**

**Kanchan Shilla<sup>1</sup> and Binoo Sehgal<sup>2</sup>**

<sup>1,2</sup>Department of Family Resource Management, I. C. COHS, CCS HAU, Hisar, Haryana

E-mail id: [Kanchan.kanya1989@gmail.com](mailto:Kanchan.kanya1989@gmail.com)

### **ABSTRACT**

*Floriculture sector creates more job opportunity due to amplified demand for the ornamental products specially flowers and makes huge involvement of unskilled, illiterate and poor people who deals with different activities of production of flowering plant. Different floricultural activities includes repetitive nature of work, awkward body posture and twisting movements which lead to development of occupational health hazards that can cause serious health problems among floriculture workers. Therefore, present study was an effort to assess the floricultural work related musculoskeletal problems using Rapid Entire Body Assessment (REBA) technique. REBA is a systematic process to evaluate the musculoskeletal disorders of whole body and risks associated with the works. All the workers of two randomly selected floriculture farms in Fatehabaad district were selected to conduct the present study. Results showed that the workers who were engaged in the different floriculture activities such as manuring, planting, irrigation, picking, pruning, packing and storage activities at floriculture work site required to forward or standing body posture for long periods of time resulting the various musculoskeletal disorders among these floriculture workers simultaneously repetitiveness of floriculture work was also a major concern. The final REBA score 13 indicate the very high risk to workers engaged in flower picking activity. Implementations of suitable changes are required while performing activity in order to make this activity less risky in terms of occupational health hazards.*

**Keywords:** Occupational Health Hazards, Rapid Entire Body Assessment, Floriculture

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### **INTRODUCTION**

The flower industry includes luxurious products with high social and aesthetic value all over the world. Flowers such as roses, marigold, carnations, gerbera, orchids, liliium etc. are now progressively produced more commercially both for export and domestic market. The escalation and growth of the floriculture industry generate the employment in farming activities in floriculture farms. In developing countries approximately 190,000 workers are employed in the cut flower business, mostly women workers which are possibly between 20-30 % more for indirect jobs in transport, plastic, construction, commercial etc. sectors [1]. Farming sector considered most unsafe sector for health and wellbeing of farm workers and floricultural workers also suffer a range of problems regarding occupational health hazards. Occupational health hazards in floricultural activities in terms of musculoskeletal discomforts. Musculoskeletal discomforts are most common in floricultural workers who involved in different floricultural activities such as land preparation, manuring, planting, irrigation, picking, pruning, packing and storage activities due to working in awkward body posture and deviation from natural body posture for longer duration. Postural discomfort arises when there is change in normal body posture to uncomfortable body posture.

### **MATERIAL AND METHODS**

Two floricultural units of Haryana state were randomly selected and all the workers working in selected floricultural units were selected for the present study. The working posture of floricultural workers was examined using Rapid Entire Body Assessment (REBA) technique to assess the discomfort faced while performing the different floricultural activities. Rapid Entire Body Assessment (REBA) was developed by Hignett and McAtamney, 2000 [2] and used as an ergonomic assessment tool to assess the working postures adopted by the floricultural workers to perform different floricultural activities. REBA is a

systematic process to evaluate the musculoskeletal disorders of whole body and risks associated with the works. On the basis of observation using the REBA worksheet, score was assigned to each of the body regions i.e. wrists, forearms, elbows, shoulders, neck, trunk, back, legs and knees. After this the score for each body region was calculated. Tables on the REBA worksheet was then used to collect a single score that represents the level of MSD risk. The activities with the involvement of high risk were numbered higher and those with the less risk involvement were numbered low and thereafter immediate actions and necessary changes were recommended.

## RESULTS

Rapid Entire Body Assessment (REBA) of workers engaged in different floricultural activities is presented in table.

**Table.1: Rapid Entire Body Assessment (REBA) score of workers engaged in different floricultural activities (n=15)**

Activity	REBA score A		REBA score B		REBA score C		Activity score		Final REBA score		Rank		Description	
	M	R	M	R	M	R	M	R	M	R	M	R	M	R
Land preparation	7	7	4	4	8	8	1	1	9	9	II	II	High risk, investigate and implement change	High risk, investigate and implement change
Planting	5	6	4	4	5	7	1	1	6	8	V	III	Medium risk, further investigate, change soon	High risk, investigate and implement change
Manuring	2	2	2	2	2	2	2	2	4	4	VI	V	Medium risk, further investigate, change soon	Medium risk, further investigate, change soon
Irrigation	7	7	4	4	8	8	0	0	8	8	III	III	High risk, investigate and implement change	High risk, investigate and implement change
Picking	9	9	7	7	11	11	2	2	13	13	I	I	Very high risk. implement change	Very high risk. implement change
Pruning	NA	4	NA	6	NA	6	NA	2	NA	8	NA	III	NA	High risk, investigate and implement change
Packing	6	6	5	5	8	8	0	0	8	8	III	III	High risk, investigate and implement change	High risk, investigate and implement change
Storage	6	6	4	4	7	7	0	0	7	7	IV	IV	Medium risk, further investigate, change soon	Medium risk, further investigate, change soon
Transportation	5	5	6	6	7	7	0	0	7	7	IV	IV	Medium risk, further investigate, change soon	Medium risk, further investigate, change soon

M=Marigold farm unit, R= Rose farm unit

## DISCUSSION

The REBA scores were allotted using REBA record sheet on the basis of videos, photographs and with precise observation of various body parts like neck, trunk, leg, arm, wrist and postural variations in terms of changes due to actions. The REBA score A depicts the scores allotted to the neck, trunk and leg analysis, REBA score B depicts the scores allotted to the arm and wrist analysis and REBA score C depicts the score obtained using REBA score A and REBA score B. The final REBA score was obtained with the help of REBA scores C and the activity score.

**Land preparation-** Results of table reveal that for both Marigold and Rose farm workers the REBA score A obtained for the land preparation activity was 7, REBA score B was 4, REBA score C was 8 and activity

score was 1 resulting the final REBA score as 9 which depicts that the high risk was found for workers engaged in land preparation. Investigation and changes required to make this activity less risky in terms of occupational health hazards.

**Planting-** For Marigold farm workers the REBA score A obtained was 5, REBA score B was 4, REBA score C was 5 and activity score was 1 resulting the final REBA score as 6 which depicts that the medium risk was found for workers engaged in planting and working method involved should be changed as soon as possible to correct the posture of the workers while performing planting activity. For Rose farm workers, REBA score A obtained was 6, REBA score B was 4, REBA score C was 7 and activity score was 1 resulting the final REBA score as 8 which depicts the high risk while planting activity therefore further investigation and changes are required.

**Manuring-** The REBA score A obtained for both Marigold and Rose farm workers was 2, REBA score B was 2, REBA score C was 2 and activity score was also 2 resulting the final REBA score as 4 which indicates that the medium risk was found for workers engaged in manuring thus investigation and changes are required to make this activity less risky in terms of occupational health hazards.

**Irrigation-** The REBA score A obtained was 7, REBA score B was 4, REBA score C was 8 and activity score was also 0 for both Marigold and Rose farm workers. The final REBA score was 8 which indicates the high risk and requirement of further investigation and changes in working method.

**Picking-** The REBA score A obtained for both Marigold and Rose farm workers was 9, REBA score B was 7, REBA score C was 11 and activity score was also 2 resulting the final REBA score as 13 which indicates that very high risk was found for workers engaged in picking so implementation of suitable changes are required to correct the posture of the workers while performing activity in order to make this activity less risky in terms of occupational health hazards.

**Pruning-** This activity was being done only in Rose farm unit and the REBA score A obtained was 4, REBA score B was 6, REBA score C was 6 and activity score was also 2 resulting the final REBA score 8 which indicate the high risk and requirement of further investigation and changes in working method to correct the posture of the workers while performing activity.

**Packing-** The REBA score A obtained for both Marigold and Rose farm workers was 6, REBA score B was 5, REBA score C was 8 and activity score was also 0 resulting the final REBA score as 8 which indicate the high risk and requirement of further investigation and changes in working method to correct the posture of the workers while performing activity.

**Storage-** The REBA score A obtained for both Marigold and Rose farm workers was 6, REBA score B was 4, REBA score C was 7 and activity score was also 0 resulting the final REBA score as 7 which indicate that the medium risk was found for workers engaged in storage activity therefore investigation of working method and changes required to correct the posture of the workers while performing storage activity to make this activity less risky in terms of occupational health hazards.

**Transportation-** The REBA score A obtained for both Marigold and Rose farm workers was 5, REBA score B was 6, REBA score C was 7 and activity score was also 0 resulted in final REBA score as 7 which depicts that the medium risk was found for workers engaged in transportation activity thus investigation and changes required to make this activity less risky in terms of occupational health hazards.

So, Floriculture work performed by mainly either forward bending or standing posture for long periods of time and repetitiveness of floriculture work creates the major concerns about high occurrence of occupational health hazards. Hagberg and Sundelin [3] reported that frequent rest intervals and postural variations help to reduce the perception of postural discomfort and musculoskeletal disorder. Results of the present study revealed that for both Marigold and Rose farm workers, the final REBA score depicts that the high risk was found for workers engaged in land preparation, irrigation and packing activities. Therefore further investigation and changes in working method required to correct the posture of the workers while performing activity in order to make these activities less risky in terms of occupational health hazards. In planting activity, for Marigold farm workers, final REBA score indicates that the medium risk was found for workers engaged in planting. Working method involved should be changed as soon as possible to correct the posture of the workers during performing planting activity whereas for Rose farm workers the final REBA score depicts the high risk during planting activity therefore further investigation and changes are required. The final REBA scores of manuring, storage and transportation activities emphasized that medium risk was found for both Marigold and Rose farm workers engaged in these activities, so changes are required to make this activity less risky. Very high risk was found for both Marigold and Rose farm workers engaged in picking activity. So implementation of suitable changes are required to correct the posture of the workers while performing activity in order to make this activity less risky in terms of occupational health hazards. Pruning activity was being done only in Rose farm unit and the final REBA score indicate the high risk and there was a requirement of further investigation and

changes in working method to correct the posture of the workers while performing activity. According to HSE [4], work-related musculoskeletal disorders (WRMSDs) are most common health problems in the agricultural farm workers especially in those workers who are involved in labor intensive practices in agriculture sector as among all work related ill health in Great Britain, prevalence of work-related musculoskeletal disorders accounted 44 percent. Njue *et al* [5] reported that floriculture work being done at awkward postures as workers have to stoop and utilize movements of hand and wrist muscles to perform the floriculture activities continuously throughout the day. Ghasemkani *et al* [6] showed in their study on musculoskeletal symptoms in workers that very frequent, quick repetitive movements with awkward postures for longer duration are hazardous for joints and muscle. Villarejo *et al* [7] also reported that agricultural work includes repetitive nature of activities, awkward body posture and twisting movements lead to development of musculoskeletal injuries that can cause serious musculoskeletal problems and long term disabilities among farm workers.

## CONCLUSION

Floriculture work demands awkward body postures and repetitive and forceful movements to accomplish the floricultural activities continuously for several hours. It can be concluded from present study that final REBA score depicts the high risk was found for both Marigold and Rose farm workers who engaged in land preparation, irrigation and packing activities. Medium risk was associated with the planting activity in Marigold farm and manuring, storage and transportation activities in both Marigold and Rose farm. Planting and pruning activity in Rose farm was found having high risk for development of occupational health hazards and picking activity at both Marigold and Rose farm was found very risky for worker working in activity as hand and wrist muscles mostly affected while plucking the flowers. Therefore implementation of suitable changes, further investigation and changes in working method required to correct the posture of worker during work and to make floriculture work less risky towards occupational health hazards.

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