

# International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 6, Special Issue 15, December 2017

## Automated Vegetable Plant Transplanter

Nataraja M<sup>1</sup>, Manjunatha C J<sup>2</sup>, Manjunatha K<sup>3</sup>, Ambuja H M<sup>4</sup>

Assistant Professor, Department of Mechanical Engineering, Sir MVIT, Bangaluru, Karnataka, India<sup>1</sup>

Assistant Professor, Department of Mechanical Engineering, SEA College of Engineering, Bangaluru,  
Karnataka, India<sup>2</sup>

Assistant Professor, Department of Mechanical Engineering, Sha Shib College of Engineering, Chickballapur,  
Karnataka, India<sup>3</sup>

Assistant Professor, Department of Civil Engineering, Sir MVIT, Bangaluru, Karnataka, India<sup>4</sup>

**ABSTRACT:** Farmers have been facing problem concerning transplanting seed seedling in the main field. Manual transplanting of plant seedling in the dry soil of the field is slow, inaccurate, costly and tedious task. The current research is to study the application of transplanting plant seedling including nursery growing and mechanical transplanting to facilitate easy application of the technique. The basic objective of sowing operation is to put the seedlings and fertilizer in rows at desired depth and seedling to seedling spacing, cover the seedling with soil and provide proper compaction over the seedling. There commended seed to seed spacing and depth of seed placement vary from crop to crop and for different agro-climate conditions to achieve optimum yields. Spacing transplants depends on the growth habit of a given variety and how plants will be grown. Design, construction and evaluation of fully automatic transplanted is the main aim of this study. The designed machine includes pneumatic cylinders that are operated with the help of air compressor. For forward and backward motions DPDT switch and battery are used.

**KEYWORDS:** Battery, Seedling, Fertilizer, DPDT Switch, Air Compressor.

### I. INTRODUCTION

An automated transplant eris an agricultural machine used for transplanting seedlings to the soil field. This is very important as it reduces the time taken to transplant seedlings (when compared to manual transplanting), thus allowing more time for harvesting. it also reduces the use of manual energy. Transplanting and planting vegetables in traditional way, is of hard job and inefficient activity. In addition, harvesting of prior crop and preparation of the substrate and transplantation should be done in a period of short time in doubled planting which by doing conventional way of transplantation, it would be hard. These factors show the need for mechanization of transplantation even more than before. Labour costs and the difference in depth of planting seedlings are of other factors that make the mechanical transplanting of vegetables seeding necessary. The introduction of the modular seedlings in greenhouse trays makes it possible to produce good quality uniform seedlings in an orderly array that could possibly be set in the field by machine.

### II. OBJECTIVE OF THE WORK

The objectives of the work are as follows

1. To develop a low cost automated vegetable transplanter.
2. To test the developed automated vegetable transplanter.
3. To carry out costing.

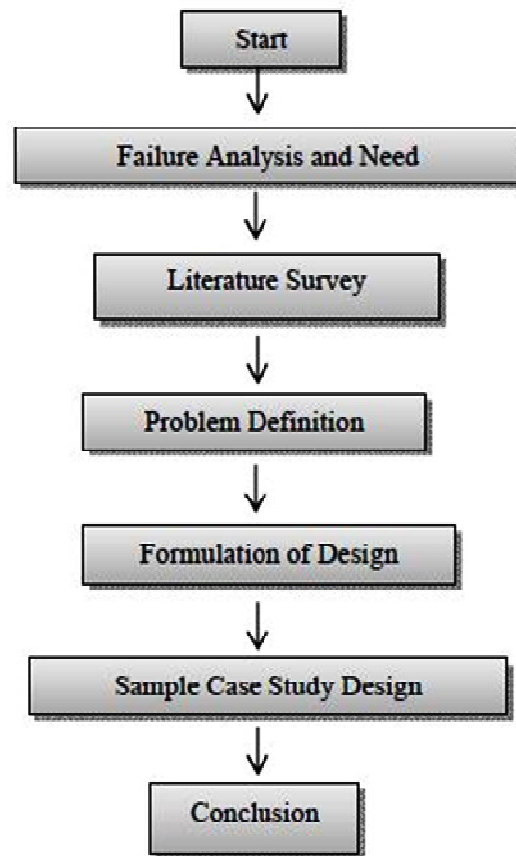
# International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 6, Special Issue 15, December 2017

## III. METHODOLOGY

The methodology of this work as follows:



## IV. COMPONENTS

Figures shows the components used in Automated Vegetable Plant transplanter:



(a)



(b)



(c)

# International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 6, Special Issue 15, December 2017

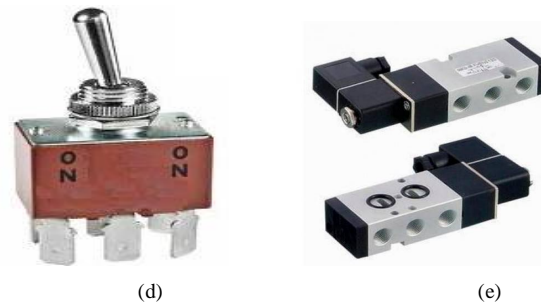


Fig.1 Components of Automated Transplanter (a) Air Compressor (b) Base plate (c) Pneumatic Cylinder (d) DTDP Switch (e) 5/2 Solenoid Valve

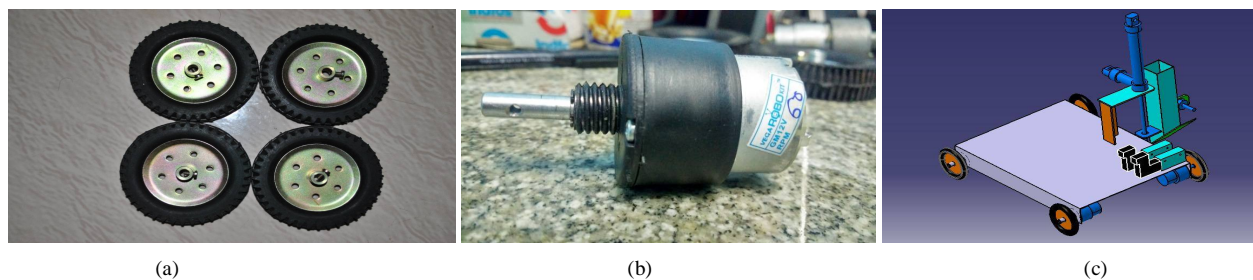


Fig. 2 Components of Automated Transplanter (a) Rubber Wheels (b) DC Motor (c) Design and Modelling

## VI. CONCLUSION

Manual transplanting of plant seedling in dry field is slow, inaccurate, costly and tedious task. Also cannot be achieved efficient production within short period of time. With concerns of seedling planting, this prototype is designed so that it helps to maintain seedling quality, labour cost reduction and cost of crop production. In this work, a small prototype of automated vegetable transplanter is designed and analyzed under very limited budget. In this work we developed a low cost automated transplanter prototype and tested for planting the seedling.

## REFERENCES

- [1] Pneumatic Cylinders - North America. Parker Hannifin. Retrieved May 3, 2011.
- [2] Perry, R.H. and Green, D.W. (Editors) (2007). Perry's Chemical Engineers' Handbook (8<sup>th</sup>ed.). McGraw Hill. ISBN 0-07-142294-3.
- [3] "Universal motor", Construction and working characteristics, Retrieved on 27 April 2015.
- [4] "Switch". The American Heritage Dictionary, College Edition. Houghton Mifflin. 1979. p. 1301.
- [5] ASCO, Engineering Information: Solenoid Valves