Design and Development of Agro Robot Rig

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Abstract: **The goal of this project is to create a robot that can climb both Areca nut trees and coconut trees, pick coconuts, and spray insecticide, which will cut down on the amount of time and labour needed to complete the same task. Farmers used to manually climb trees to the top and spray insecticide onto areca nut bushes back in the day. They would leap to the nearby tree after applying pesticides on the areca nuts. They would leap to the nearby tree after applying pesticides on the areca nuts. The arecanut is one of the crops that has been most negatively impacted by this. For a successful harvest, the tree must be climbed a least of five times year, twice for a prophylactic spray against fungus and three times for arecanut harvesting. Only skilled workers are able to complete this task. The harvesting of the coconuts is the issue we are having. The structure and height of the tree is the problem and, in a year, we have to climb coconut trees 4 to 5 times. We have some fuel operated machines to climb the trees but in today's life usage of fuels are very expensive and we have to go along with the machine, all the farmers may not go to such a height because some of them may have height phobia. So, we have come up with this project, which is controlled by remote. This robot lessens the need for labour and saves time. With a high degree of accuracy, the sprayer accurately applies pesticide to the nearby trees. Remote controls are used to manage the pesticide flow. The camera vision is also used in the robot to harvest the coconuts accurately.**

Image acquisition system will be integrated with robot arm end effect or using raspberry pi and camera module. This IAS will detect ripen coconut and plug the coconut from the tree, using robot end effect or blade. IAS will also detect the areca nut bunch and it will adjust the spray gun and sprays the pesticide to the areca nuts. Totally it would be a automated system. Even we are planning to implement this rover to harvest yields from palm oil trees.

Key Words**- Agro robot, areca nut, Controller, Pesticide**

I.INTRODUCTION

The entire coastal strip of India is planted with coconut palms. Kerala, Karnataka, and Tamil Nadu receive the lion's share of the market, followed by Goa, Maharashtra, Andhra Pradesh, and Orissa. One month before they reach full maturity, the well-developed nuts should be harvested. Nut harvesting is a dangerous and skilled job. Each year, 2 to 6 harvestings are possible. Per tree, averages of 80 to 100 nuts are gathered annually. However, finding manual tree climbers to harvest the coconuts and areca nuts presents significant challenges for the coconut and areca nut farmers.

There is a severe lack of human tree climbers everywhere, not just in India. In India, historically, the socially and economically underprivileged have held this position. People shift to a number of high paying positions as the literacy rate rises and India's economy expands. It's a dangerous work as well, and accidents can sometimes be fatal. If the climber is the only person earning an income and taking care of the family, this might be a blow to the entire family without adequate insurance coverage. Additionally, it has been discovered that persons who work in this field for a long time get skin-related problems. Therefore, improved methods must be developed to collect coconuts.

To overcome this we planned to Design and manufacture agro-robot using Solid works, Master cam CNC programming and Arduino programming. Thus to eliminate labor problems with respect to climbing the tree and to avoid accidents while climbing the coconut and areca nut trees.

II.PROBLEM DEFINITION

In recent years, non- availability of labor's has emerged as one of the biggest challenges in farming. The crops that have been most affected by this is the areca nut and coconut. In a year we have to climb areca nut and coconut trees around 6 to 7 and 4 to 5 times respectively. Areca and coconut trees attain a height of about 60-70 feet. It is mandatory to climb the trees a minimum of five times a year for a successful harvest of coconuts - twice for the preventive spray against fungal disease, and thrice to harvest the areca nut.

Ceratobasidium noxium (Koleroga) is another such disease prevalent in high rainfall regions. This disease assumes intensity during south- west monsoon causing heavy damage to the crop.