

# A STUDY ON PLASTIC MULCH AND ITS COLOR AFFECTING PLANT GROWTH

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## 1 Statement of the problem

The objective is to see the plant growth with or without the provision of plastic mulches by using garden pot instead of field. The researchers aim to answer the question: The objective is to see the plant growth with or without the provision of plastic mulches by using garden pot instead of field. The researchers aim to answer the question

## 2 Hypotheses

### 2.1 Null Hypothesis

Plastic mulch and its color may not affect plant growth.

### 2.2 Alternative Hypothesis/es

Plastic mulch and its color may affect plant growth

## 3 Significance of the Study

This study will give information to the agriculturists, farmers, plant grower and students about the difference of plant growth with or without using plastic mulch. This study will help them know the benefits of plastic mulch and will give them the idea of what color of plastic mulch will suit tomatoes, eggplant and okra using garden pot. For those who lives in the cities, they will know that they can grow plants on their concrete floors

## 4 Review of Related Literature

Plant growth is often measured as a change in area, length, volume, height, wet or dry weight. These methods may not always be a satisfactory measure of growth at a particular stage of plant development, such as a germinating seed may show an overall loss in dry weight due to the utilization of food reserves during respiration, although the seed is definitely growing as evidenced by its emerging roots and shoots The relative growth rate (RGR) which is the size

increase per unit interval of time has two components: the net assimilation rate (NAR) and the leaf area ratio (LAR). The NAR is the rate of increase of dry weight per unit time per unit of leaf surface which is a measure of the amount of photosynthetic product going into plant material. The LAR is the ratio of leaf area to dry weight which is the measure of the proportion of the plant that is engaged in photosynthesis. Combined they give a relative description of growth over time based upon plant characteristics. 4 According to Dr. Ngouajio, whose work is funded in part by Michigan State University AgBioResearch, A loose plastic is a serious threat to the crop, especially to young transplants because they are fragile. As indicated earlier, black mulches allow little light to pass through. They first absorb the light, which is then converted into heat. The heat is finally transferred to the soil. For greatest efficiency, it is critical to have close contact between plastic and soil. On a clear and sunny day, Crop injury can also occur even if the crop is not in direct contact with hot plastic mulch. During a sunny day, hot air builds up between the plastic and the soil. Therefore, if the plastic is loose, its flapping (even under a light wind) creates movement of hot air and funnels it through crop holes. This causes stem girdling and transplant desiccation, a problem commonly observed with young pepper transplants. Such plants become very susceptible to wind damage and should be staked and tied as early as possible. To avoid all those problems keep your plastic mulch tight on the bed. 5 A two year study in Iowa State Research Farm on March 26, 2012 and March 27, 2013, tomato seeds (*Solanum lycopersicum* 'Mt. Spring') were seeded into a soilless greenhouse medium (Sunshine LC1 Mix). On May 3, 2012 and May 10, 2013, tomato plants were transplanted into raised beds. Each treatment had a single bed with a total of 10 plants. In-row spacing between plants was 18 in. (46 cm). Treatments included: 1) bare ground, 2) black plastic, 3) blue plastic 4) olive plastic, and 5) red plastic. Tomatoes were harvested six times in 2012 starting July 17, and eight times in 2013 starting July 23, at weekly intervals. Both years, four fruits were randomly collected from the fourth harvests. The study did not reveal any statistically significant difference using different colored mulch. Both fruit numbers and marketable yields were statistically similar among treatments in both years. 6 The research was conducted at the E.V. Smith Research Experiment Station in Shorter, AL. The soil type is an Orangeburg sandy loam (fine-loamy siliceous thermic Typic Kandiudult). Field plots to evaluate the effects of colored plastic mulches and row covers on the growth and production of 'Clemson Spineless' okra were established in May 2003 and Apr. 2004. The blue, silver, red, white, and black plastic mulch are used. Significant differences between treatments were found for mulch color.

The combined total yields (marketable yield plus cull) were greater with row covers than without. Significantly lower yields were produced with bare soil than with any colored mulches used. Blue plastic mulch resulted in the highest early yield and maintained its productivity through harvest yielding the second highest combined total yield. At harvest, black plastic mulch resulted in the highest combined total yield. In our study the results were inconsistent on this point. Bare soil always produced the lowest early yield; however, the difference was only significant in 2004. Early yield was generally greatest with dark mulch colors and the combined total yield greatest with black and blue plastic mulch. 7 Research continues, most notably at the Pennsylvania State University Plasticulture Center; In a summary they set forth in 2000, Red, metalized Silver, Dark

Blue and Green IRT are used. They noted that though many vegetables can be grown successfully using plastic mulches, cucumbers, eggplant, muskmelons, okra peppers, squash, tomatoes, and watermelons showed the most significant responses.

Eggplant- this crop appears to respond better to red mulch (as compared to black), with an average 12yield over a 2-year period. The greatest response of eggplant to red mulch was observed when plants were growing under stress conditions of temperature and water). There may be varietal differences of response in eggplant to the use of plastic mulch. Tomato- this crop appears to respond more to red mulch compared to black with an average 12over a 3 year period. There appears to be a reduction in the incidence of early blight in plants grown on red mulch compared to plants grown on black mulch. When environmental conditions for plant growth are ideal, tomato response to red mulch is minimal. 8

## 5 Statement of the Research Question

Can plastic mulch and its color affect plant growth? .

## 6 References

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