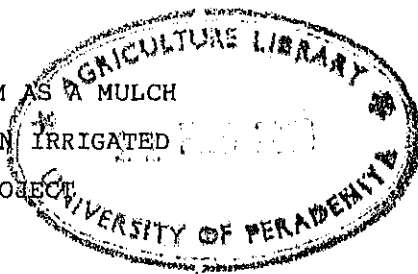


FEASIBILITY OF USING BLACK POLY-ETHYLENE FILM AS A MULCH  
FOR MOISTURE CONSERVATION AND WEED CONTROL IN IRRIGATED  
CHILLI IN SYSTEM H AREA OF MAHAWELI PROJECT



By

ANANDA PUSHPAKUMARA ROHITHA JAYASINGHE

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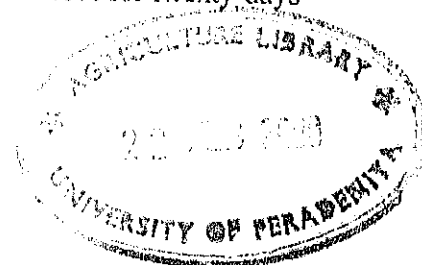
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## ABSTRACT

An experiment was conducted at Maha Illuppallama Regional Agricultural Research Centre, during 1990 *Yala* season to investigate the feasibility of using black polyethylene film (0.0065 cm. thickness) as a mulch for moisture conservation and weed control of irrigated chilli. The main treatments were mulching and no-mulching, 50% and 75% moisture depletion and application of half and full recommended dose of fertilizer. The experiment was conducted from first week of May to first week of October, 1990.

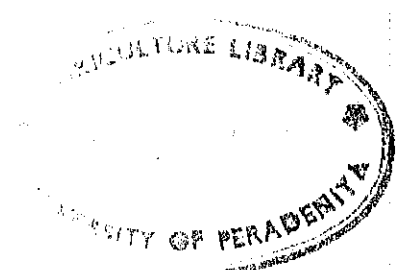
The results indicated that the black polyethylene film (PEF) mulch can be used to extend the availability of irrigation water with respect to cultivated area as well as time by reducing direct surface evaporation. The commonly adopted irrigation interval of once in seven days (seven-day-rotation) can be extended further by using the black PEF mulch which allows for increased availability of water for a further period. This indicates the possibility of increasing the extent cultivated. The experiment showed that irrigation rotation can be extended to once in twenty days (twenty-day-rotation) for chilli without any harm to the yield, with the irrigation practices adopted at present. The field water use efficiency under the black PEF mulch at twenty-days- rotation was 0.625 kg per m<sup>3</sup> which is 3.4 times of the value of 0.184 kg per m<sup>3</sup> for normal practice of seven-days-rotation without mulch which was the control treatment. The field water use efficiency under the black PEF mulch at fourteen-days-rotation was 0.474 kg per m<sup>3</sup> compared to the normal practice. The water saving with black PEF mulch was 48% for twenty-days-



rotation and 47% for fourteen-days-rotation as compared to the quantity used for standard practice of seven-days- rotation without mulch. The ability to stretch the cultivated extent with the same quantity of water as compared to standard practice of seven-days-rotation, was 91% more for twenty- days-rotation and 89% more for fourteen-days-rotation under black PEF mulch. The cultivated extent per unit of water for the seven-days-rotation without mulch was  $0.0217 \text{ ha/ m}^3$ , whereas, it was  $0.0416 \text{ ha/ m}^3$  for twenty-days-rotation with mulch and  $0.0411 \text{ ha/ m}^3$  for fourteen-days-rotation with mulch.

The black PEF mulch has significantly increased the canopy spread, root spread, pod yield and number of pods per plant, and significantly decreased the pod weight. The pod yield has been almost doubled by the influence of black PEF mulch under the experimental conditions. Application of half of the recommended quantity of fertilizer has not influenced the yield of chilli with or without the mulch under the experimental conditions.

The black PEF mulch has effectively smothered and controlled weeds of all types on location including the problem weed of *Cyperus rotundus*, by blocking the photosynthetic light energy. Preliminary observations did not show differences in pest and disease incidence under the influence of black PEF mulch.



The cost : benefit ratio of black PEF mulch for chilli under the experimental condition was 1:1.79 which is not very attractive for an investment of such a magnitude unless reused for another season without fresh tillage operations or the cost of the film is reduced. However, the study leads to further researchable avenues for future.