

SHADE STRUCTURES

Introduction

Shade can greatly reduce the temperature of any fresh produce that is being handled outdoors. Early postharvest studies demonstrated the positive effect of shade on all types of fresh produce, keeping it cooler and reducing the rate of water loss (Rickard and Coursey, 1979).

Design Options & Materials Needed

Deep shade can be provided by permanent structures or by adding overhangs or awning to existing buildings, or can be provided with lower cost, more portable means. Ready-made market umbrellas are one option, and using full-scale marketing booths or tents (made of cloth, thatch, wood or any type of cover) to shade assembly points, packing operations or retail marketing is another option. During transport, loads should be covered with light colored tarpaulins that reflect heat and reduce contamination from dust, birds and debris.

Simple cloth covers (used cloth sacks sewn together and lifted on wooden poles)



Market umbrella



Thatched roof



PolyNet shade structure

design by idac, Amity University, India (2009)

Costs & Benefits

Structures can be low cost (cloth or plastic sheets stretched overhead), medium cost (market umbrellas sell for \$15 to \$50 each) or higher cost (portable PolyNet shade covers made with galvanized curved poles cost \$120 to \$150 each), but in all cases, returns on investment (ROI) tend to be relatively fast (with full payback in two to four uses, and profits accruing thereafter with each use). Research studies in Ghana during 2009 confirmed that weight loss for tomatoes during marketing was reduced by 50% (with 4% loss under shade versus 8% loss in un-shaded conditions in 6 hours under hot/dry conditions), while fresh spinach in India was protected from

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weight loss during preparation for market and packing under shade even during cooler weather, where losses were reduced from 5% to 1% (Kitinoja 2010).

Instructions for making your own simple style PolyNet Shade Cover

70% to 90% shade cloth (loosely knitted Polypropylene fabric) in white or a light color

The length of the cloth can be any size up to 6 meters; the width should be 4 - 5 meters (150 - 190 inches)

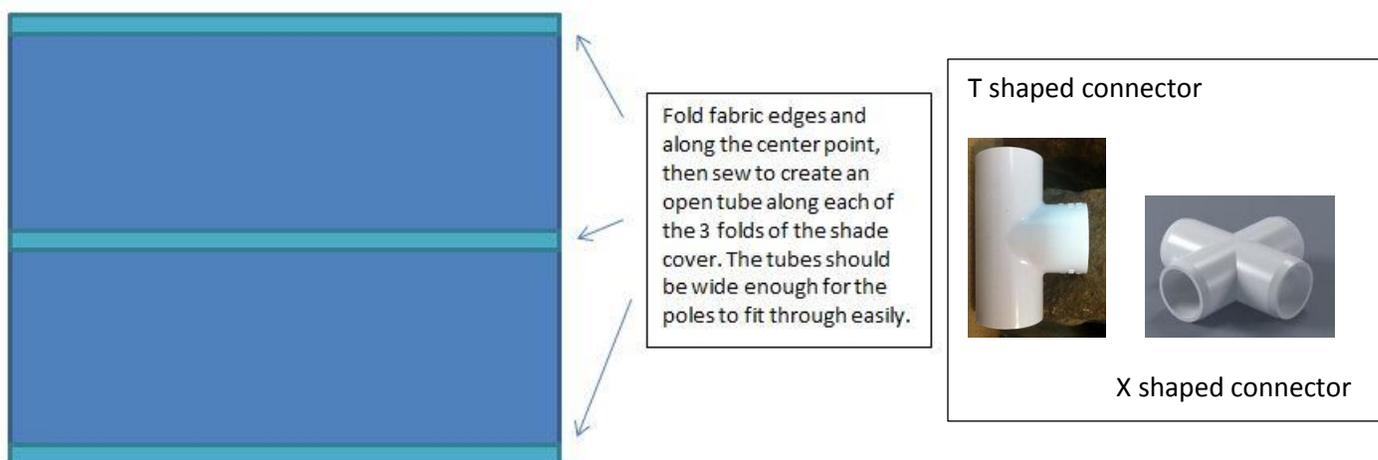
The total length of the 3 curved metal (approx. 1 inch in diameter) poles should be just a bit longer than the desired width. Each of the 6 pole legs should be about 1 meter long.

The cloth should be sewn to have three tubes of fabric running across the entire width (see illustration below)

Each of the 3 curved poles are then pushed through one of the fabric tubes.

Cross bars (half the length of the shade) for support should be inserted on both sides using 4 T-shaped and 2 X-shaped pipe connectors.

Anchor (with stakes or a heavy object) and secure at the six points where the poles touch ground.



References

Rickard, J.E. and D.G. Coursey (1979). The value of shading perishable produce after harvest. *Appropriate Technology* 6(2):18-19. <http://ucce.ucdavis.edu/files/datastore/234-1534.pdf>

Kitinoja (2010). Identification of Appropriate Postharvest Technologies for Improving Market Access and Incomes for Small Horticultural Farmers in Sub-Saharan Africa and South Asia. WFO report for BMGF Grant 52198. <http://ucce.ucdavis.edu/files/datastore/234-1847.pdf>

For further information

PolyNet shade designed by idac at Amity University (India) in Kitinoja (2010)

Small-scale postharvest handling practices: A manual for horticultural crops (see Chapter 1; 5th edition 2015) http://ucanr.edu/sites/Postharvest_Technology_Center_/files/231952.pdf

Postharvest Technology Center (UC Davis) <http://postharvest.ucdavis.edu>

The Postharvest Education Foundation <http://www.postharvest.org>

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