PLANNING AND CONSTRUCTING AN OUTSIDE FLOAT BED FOR TOBACCO TRANSPLANT PRODUCTION

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Introduction

Good management is required to be successful in direct seeding tobacco in outside float beds. The most critical factors are managing temperature, rain, condensation, fertilization, disease, and clipping. It is essential that a manager be available at all times - especially for the first four weeks after seeding. Outdoor direct seeding substitutes the need for more intense management for the overhead expense associated with purchasing a greenhouse. For detailed information on tray selection, media, fertilization, clipping etc. please see University of Kentucky Cooperative Extension Publication ID 132 "Management of Tobacco Float Systems".

How to Determine the Number of Float Trays Needed

Choose the float tray that will work the best in your operation. Float trays come in 200, 242, 253, 288, 338, 338D and 392 cell numbers. Lower cell numbers (288 or less) are generally easier to manage in an outside bed. All float trays have approximately the same outside dimensions, 13½" wide x 26¼" long. Use the following table to determine the number of tobacco plants you will need to set one acre of tobacco.

Plant Populations per acre Resulting from Selected In-Row and Between-Row Plant Spacing Combinations

Tobacco Field Row Width (in.)	Distance Between Tobacco Plants In Row (in.)			
	18	20	22	24
36	9680	8712	7920	7260
40	8712	7842	7128	6540
42	8297	7472	6795	6223
44	7920	7130	6480	5942
46	7589	6860	6223	5687
48	7260	6560	5951	5445

A row width of 42 inches with plants spaced 22 inches apart in the row will give a plant population of 6,795 plants per acre. Divide the number of plants that you are setting per acre by 80% (the average number of plants that make it to the field.) Divide that number by the cell size of the tray you have chosen. This will be the number of trays needed per acre in your operation.

Example: 6795 divided by 80% = 8494 divided by 242 = 35.10 (round to 36 trays per acre)

The optimum population range is 6200 to 7200 plants per acre. Higher populations tend to increase labor costs, disease problems such as blue mold and therefore decreases net return. Wider row spacing is helpful to move sprayer equipment through the field for sucker control treatment and blue mold control. More curing space is also required for higher populations.

Float Bed Location

Select location with some wind protection, keeping in mind that full sun and air circulation are important.

Float Bed Construction (one popular design)

Plan ahead, have your beds constructed before the day you plan to seed.

Float beds should be nine feet 1 inch wide for the inside dimensions. This will allow four trays to lay in the bed, narrow end to end, across the float bed. Covers and plastic will work well for this dimension. When determining the length of bed, divide the number of trays needed by four and multiply that number by 13.75 (width of tray plus ¼") which gives you the number of inches for the length of the bed inside dimensions.

Place no more than approximately 80 trays per body of water to prevent wide scale spread of diseases should a disease problem occur in one water bed section.

Level ground as much as possible and keep the tops of float bed sides level. 2" x 8" lumber works well for float bed construction. This keeps water from being too deep or shallow but does allow for some compensation for uneven ground.

To control heat buildup, beds should be no longer than about 42 feet for proper air ventilation.

Ground Barrier for Float Bed

After float bed frame is constructed, put down your ground barrier. Agricultural limestone or sand are good. If sawdust is used, sift or remove sharp objects which may puncture plastic. Corn silage has been used with success.

Bed Liner

The bed liner should be premium grade resin 4.5 mil or 6 mil black plastic. Do not use a construction grade of black plastic. Lay plastic in frame work of bed then add water to settle the plastic evenly throughout the bed. Staple the plastic to the top of the bed frame after filling. Stapling over a nylon twine or a thin plastic strip laid over the plastic on top of the frame will keep the plastic more secure.

Bow Construction

Bow construction is one place you may want to use your imagination and use your own ideas. Here is one example of a bow that is widely used. For bow construction, 3/4-inch schedule 40 white PVC pipe seems to work the best. For a 9-foot bed, use a 10-foot piece to make the proper arch. Drill 1 1/8 inch holes 3 feet apart down each side of the bed. Be sure each side matches with hole placement. Drill 1 1/8-inch holes about 3 to 4 inches deep. Place a 10-inch piece of 3/4-inch schedule 40 white PVC pipe in each of the holes. Place a 45-degree elbow)on the end of each of these risers. Run your 10-foot bow from one elbow to the corresponding riser across the bed. Repeat the process down the bed.

There are two important things to know and remember about your bows. Strength is of utmost importance in keeping covers in place. Bows should be constructed so that water will not puddle on cover over the bed. Use 4-way PVC "t" connection in bow construction to strengthen bows if possible. Don't glue due to possible need for changes.

Bed Covers

The bed cover choices are Reemay/Typar and Continental. The Reemay/Typar cover is spunbonded polypropylene and the Continental is spunbonded polyethylene. Place the cover over the bed and fasten very securely to prevent the wind from blowing off the cover. Keep in mind the ends will need to be opened for ventilation and the cover removed for

fungicide applications and clipping. More information on float bed covers can be found in the publication ID132.

Temperature Monitoring

Temperature control is a very important management consideration. An easy to read thermometer placed at tray level away from the ends, and near the center of the bed will help accurately monitor temperature through the entire growing process.

Safety Precaution

As a safety precaution, always use a "Ground Fault Circuit Interrupter" when using electrical around the float bed water. This device is inexpensive and could prevent injury should an electrical device come in contact with the float bed water. GFCI devises that can be plugged into the an outlet and accommodate an extension cord are available.

Rain and Condensation Water Drip Protection Using Plastic and Corner Moldings

Water drops from rain and heavy condensation can destroy a newly seeded float bed. Water dripping from the cover will dislodge the germinating seed and media in the tray cells. This is a potential problem until the plant is about the size of a quarter.

One way to prevent the problem from rain is to cover the bed with 3- 4 mil plastic before a rain and remove soon after the rain to prevent heat damage. CAUTION: failure to remove the plastic can cause severe damage due to quick temperature increases when the sun comes out. A safer option is to use two Reemay or Continental covers instead of plastic. Continental covers may have better rainfall shedding properties.

Condensation will also cause water drips primarily from where the cover comes in contact with the support bow. A plastic corner molding can be attached to the underneath side of the support bow with duct tape to prevent the water drips. The drips collect in the "V" of the corner molding and drains to either side. Proper ventilation will reduce condensation.

It is important to attach the cover and plastic securely to withstand windy weather. Nylon twine (grass twine stretches) can be weaved from bow to bow to help hold the cover and plastic on to the bows.