

Root Growth Capacity System₁

Gary R. Hileman²

Abstract.--Design of a Root Growth Capacity (RGC) System that has the capability of creating a favorable environment for initiation of root growth. System construction, parts, and labor were done for approximately \$5,500. Blueprints are available.

SYSTEM SEQUENCE

Heated water is pumped from the holding tank, through a solenoid controlled valve, a self-cleaning filter, the mist-chamber pressure gauge, and fog-nozzels. The water is collected on the bottom of the mist-chamber and is gravity carried through a screen-plug in the chamber drain hole and gravity carried through a cartridge filter before going back into the holding tank. Water level in the holding tank is controlled by a float valve on a hose from the water source.

HEATER AND PUMP ASSEMBLY

A 1/2 h.p. pump is used to circulate water from the holding tank to the fog-nozzels in the mist-chambers, 45 p.s.i. It runs constantly, bypassing back to the holding tank when not pumping to the mist-chambers. The reason for this is because of the constant onoff cycle of the mist timer. If the pump had to turn on and off so frequently, it would soon burn out. The misting sequence is triggered by a timer that can be set in 5 second intervals every 10 minutes. When triggered, an electric solenoid opens and allows the water to go through a self-cleaning filter into the designated mist-chambers.

ROOT GROWTH CHAMBER

The mist-chamber is a fiberglass tank approximately 8'x2.5'x2.5'--just the size of a coffin liner. The tank was painted black to eliminate light in the root zone. Tanks were mounted on an angle-iron frame with walkways between the chambers. The clamps that hold the seedlings are made of two pieces of cedar with foam attached to prevent damage to the seedling stems. The hinges are woven nylon strips stapled to the ends of the cedar boards. Each clamp holds 20 seedlings, and each tank holds approximately 300 seedlings.

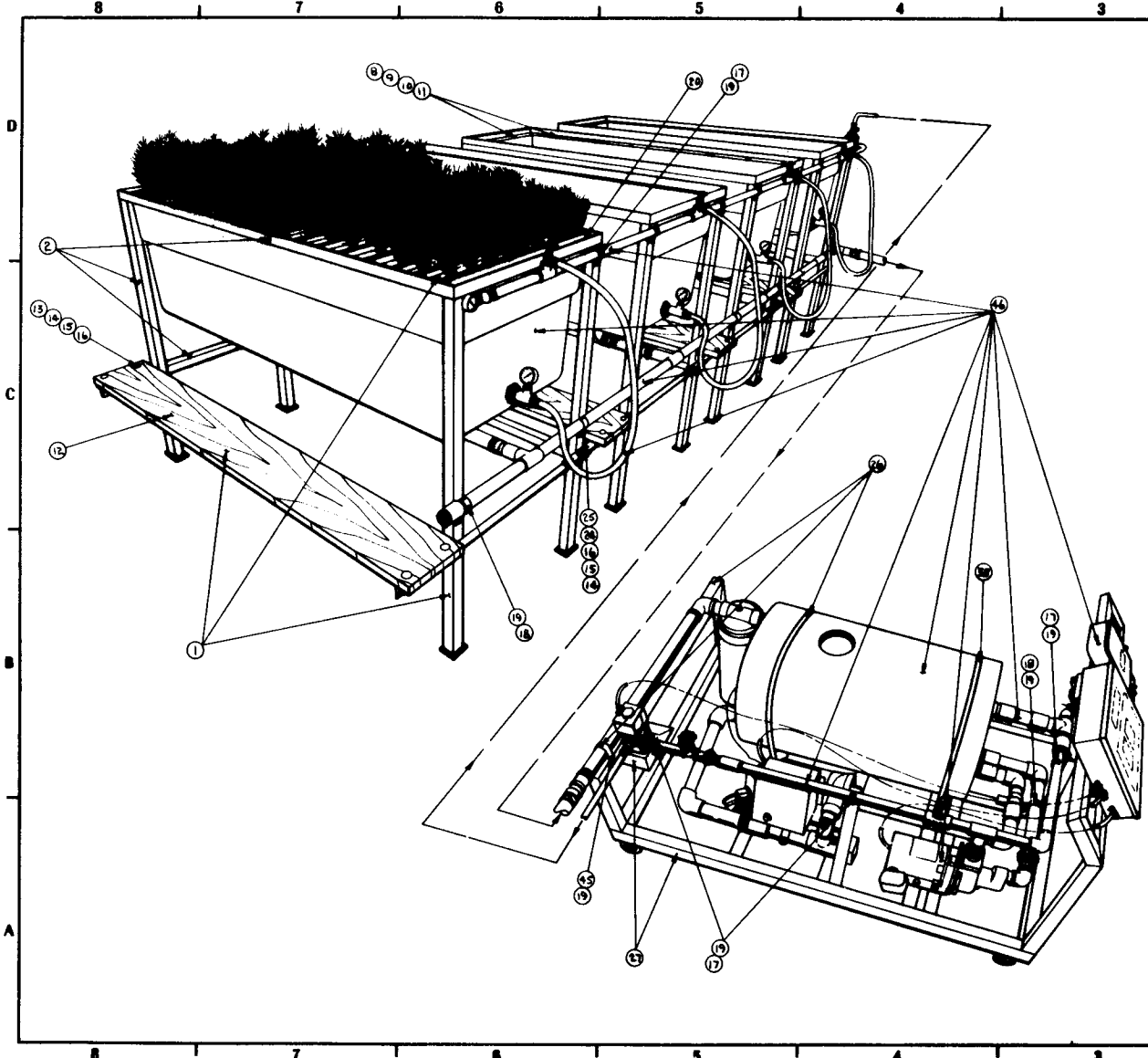
Blueprints for the entire system are available from the author.

ROOM SPECIFICATIONS

To have year-round capability of the system, the room requires forced-air heating/cooling, adequate lighting, and room-air humidity control. We accomplished this with a propane furnace, air humidifier, swamp cooler, side and roof windows, and four banks of florescent lights. Good insulation helps reduce energy consumption.

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MATERIALS LIST			
NO	PART NAME	QTY	MATERIAL DESCRIPTION
1	SPRAY CHAMBER FRAME	4	PARTS 2-5*
2	SPRAY CHAMBER PT	4	PARTS 6-7
3	SCREEN	1	1/2" X 1/2" MESH GALV. HEAD WASHING SCREEN
4	WASHER	4	1/2" PLAT WASHERS
10	WASHER (LOCK)	4	1/2" LOCK WASHERS
11	NUTS	4	1/2" HIGH HEAD NUTS
12	WASHER	4	1/2" LOCK WASHERS
13	NUTS	4	1/2" HIGH HEAD NUTS
14	WASHER	4	1/2" LOCK WASHERS
15	NUTS	4	1/2" HIGH HEAD NUTS
16	WASHER	4	1/2" LOCK WASHERS
17	PIPE CLAMP (1/2")	10	1/2" HIGH DUTY SUB-MER. PIPE CLIP
18	PIPE CLAMP (3/4")	10	3/4" HIGH DUTY SUB-MER. PIPE CLIP
19	SCREEN	20	1/2" MESH GALV. HEAD WASHING SCREEN
20	SANDBLIND HOLDER	4	PARTS 21-22
21	SPRAYER BASE	4	PARTY 23
22	BOLT	75	1/4" X 1/2" HEX HEAD BOLT
23	PLASTIC/STY. PENN	1	PARTS 24-25
24	PLASTIC/STY. PENN	1	PARTS 26-27
25	TANK HOLD-DOWN	2	PARTS 28-29
26	RETURN LINE GRIP	1	1/2" X 1/2" INCH STAINLESS STL BANDIT BANDS
27	PLASTIC/STY. PENN	1	PARTS 30-31

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DESIGNED BY	T. GOTT	TITLE	ROOT GROWTH POTENTIAL SYSTEM
CHECKED BY	HILDEMAN		
APPROVED			
SCALE	1/8" = 1"		
DATE	1958 FEB 10	SHEET	1 OF 1 LPH-7

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