

Ornamental Fish Farming

for several or many species each grouped together in their own areas. For example, all broodstock are held in one or two purpose-designed areas, and all spawning tanks are situated together in a dedicated spawning area. As far as possible these must be positioned so as to maximize ease of operation and streamline the flow of activities. This principle of grouping is demonstrated in FIG 2.4 in Example 2.

Example 2: Semi-intensive shed production layout (all indoors, temperature-controlled).

Dimensions of the shed shown in FIG 2.4: 24 metres (78 ft) long, by 7.5 metres (24 ft) wide, by 2.4 metres (7.8 ft) high at the walls. The floor of one quarter of the area (E) is concreted to hold spawning and larval rearing tanks, and for the packing area. **This area is sloped to drainage points.** Walls (I) are insulated on the inside with 20 mm (0.8 in) thick polyurethane (sprayed on). A

series of clear roof sheets (doubled for insulation), shown in FIG 2.3 are used on about 15% of the roof area to provide natural light and heat input in winter.

Double doors (A) at each end of the shed provide access and can be opened to allow air to flow through in hot weather. A 225 000 BTU gas heater of a type commonly used on poultry farms heats this and another shed of 36 x 7.5 metre (117 x 24 ft). The heater easily heats these two sheds (a total of 375 square metres/4030 square feet of floor area) in a subtropical climate which produces, on average, about 15 days of frost each winter.

The first 7 tanks (G) in the grow-out area are used for **holding** and **conditioning broodstock**. The **spawning area (B)** houses 57 glass tanks of 600 x 300 x 300 mm (24 x 12 x 12 in), in 19 tiers of 3 as shown. These are suitable for spawning a great many species of small to medium-sized egg-scatterers and other batch-spawners. In addition, 6 tanks of 900 x 300 x 300 mm (36 x 12 x 12 in) are suitable for spawning large barbs,



FIG 2.3. Insulated semi-intensive indoor facility under construction, utilizing 150 x 600 litre (158 gal) grow-out tanks. Note sand base, paved walk-ways, and periodic clear roof sheets. (Kilcoy Ornamental Fish, Queensland, Australia.)

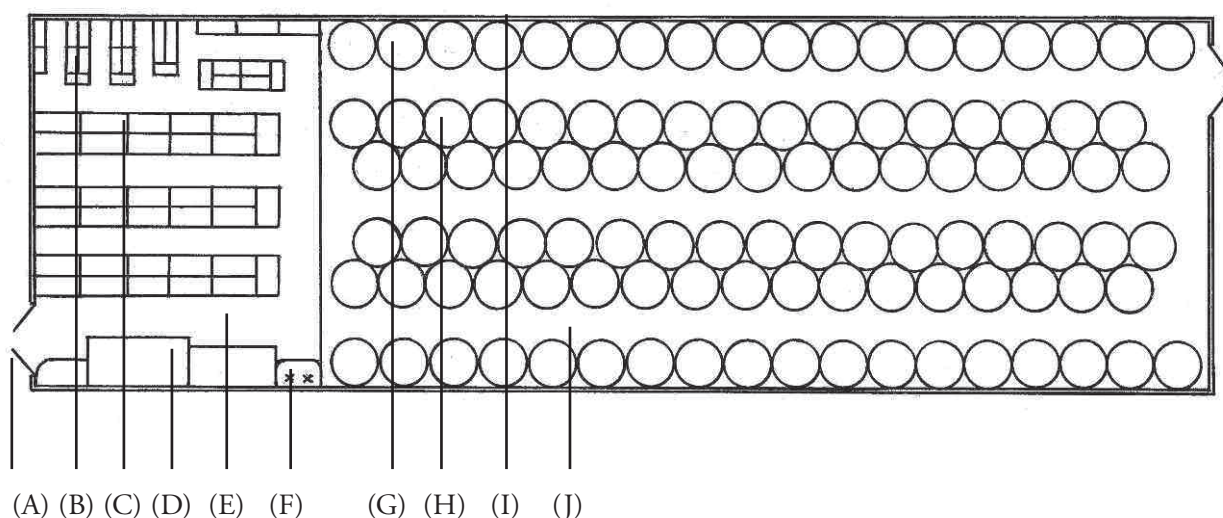


FIG 2.4. *This depicts a production facility housed in an insulated shed, using 104 x 600 litre (158 gal) plastic-lined sheet metal-walled tanks, capable of producing an average monthly output of about 15 000 x 30 to 40 mm (1.2 to 1.6 in) tetras, barbs, danios, rasboras, angelfish and other small species. (See FIG 2.3, which is a semi-intensive production facility on which FIG 2.4 is based.)*

- (A) Double door at each end of the shed
- (B) Spawning area, glass tanks on concrete floor
- (C) Larval rearing, in glass tanks on the concrete floor
- (D) Packing area
- (E) Reinforced concrete floor in 25% of the shed area
- (F) Wash basin
- (G) 600 litre (158 gal) tanks 1 to 7 house broodstock
- (H) Total of 600 litre (158 gal) grow-out tanks, on sand base
- (I) Polyurethane-insulated corrugated steel walls
- (J) Walkway, with paving blocks on sand

giant danios and spotted silver dollars etc. For even larger breeders such as Congo tetras, silver dollars and other species needing more space, 9 tanks of 900 x 400 x 400 mm (36 x 16 x 16 in) are used, also set up in tiers of 3. This spawning area is capable of producing approximately 45 000 egg-scatterers per month, depending on the species. This exceeds the grow-out capacity of this shed and the excess is transferred to other sheds for the first stage of rearing and then grow-out.

The **first-stage rearing of larvae** takes place in area (C) where 99 glass tanks of 900 x 400 x 400 mm (36 x 16 x 16 in) are used for larval rearing up to about two months of age. These tanks are positioned in 33 tiers of 3 tanks each. About 60% of these are divided in half. The half-tanks are divided by means of glued-in glass dividers. This is useful where the number of fry

which can be reared in each half-tank is the same number required to stock into each 600 litre (158 gal) grow-out tank once they have reached about 2 months of age. Half-tanks are also more suitable for the small batches of larvae produced by some species. Where preferable for the species, larger numbers of larvae are reared in undivided tanks. These are either split before stocking into 600 litre (158 gal) grow-out tanks, or they are stocked into bigger grow-out systems.

The **grow-out** area houses 104 x 600 litre (158 gal) homemade tanks (shown as small round circles in FIG 2.4). These consist of plastic liners supported by a round, sheet-metal frame (H). Of these, about 7 are used to hold broodstock. The remainder are used to grow fish out from about 2 months old to sellable size. On average these tanks each produce about 150 sellable fish per month of