

Production of Hybrid Tilapia in Ponds in Guangzhou with a Soy-Maximized, Extruded Feed

Results of ASA/China 2004 Feeding Trial 35-04-85

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ABSTRACT

A feeding trial was conducted to demonstrate fingerling to market growth performance of hybrid tilapia in ponds in the Guangzhou, China region using a soy-maximized, all-plant protein feed. Fish were stocked in three, 4.7-mu (0.31-ha) ponds at a density of 800 hybrid tilapia and 100 silver carp per mu (12,000 tilapia and 1,500 silver carp per ha). Hybrid tilapia grew from 79 g to an average weight of 497 g per fish in 124 days of feeding. Gross production of harvestable size fish averaged 390 kg/mu (5,851 kg/ha) for hybrid tilapia and 32 kg/mu (476 kg/ha) for silver carp. Average estimated FCR with hybrid tilapia was 1.63:1. Low fish production and poor FCR were the result of significant tilapia reproduction in the three trial ponds, indicating poor quality hybrid stock. The trial was terminated early, before the tilapia could reach the 600-g target market size because of the tilapia reproduction problem.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with the Guangdong Provincial Fishery Extension Center and the Nanhai Keda Hengsheng Fishery Co. Ltd. fish farm in Guangzhou, Guangdong Province, conducted a pond feeding trial with hybrid tilapia. The objective of the trial was to demonstrate hybrid tilapia growth and economic performance from fingerling to market stages with the ASA 32/6 soy-maximized feed and the ASA 80:20 pond production model.

MATERIALS AND METHODS

Three ponds of average size 4.7-mu (0.31-ha) at the Nanhai Keda Hengsheng Fishery Co. Ltd. fish farm in Guangzhou, Guangdong Province, China were used for the feeding trial. Pond water depth averaged 1.5 m. All ponds were equipped with water exchange and stand-by aeration.

Fish were hybrid tilapia produced at the Nanhai Keda Hengsheng Fishery Co. Ltd. fish farm. Hybrid tilapia were stocked in the three trial ponds on 29 April at an average size of 79 g and at a density of 800 fish per mu (12,000/ha)¹, together with 100 silver carp fingerlings per mu (1,500/ha). Fish in all three trial ponds were of uniform size and age at stocking. Target market size for hybrid tilapia was 600 g per fish.

Hybrid tilapia were fed the ASA 32/6 all-plant protein feed in extruded, floating pellet form (Table 1). The feed was formulated by ASA to maximize soybean meal use. The feed was produced by Fwusow feed mill in Xiamen, Fujian Province. Fish were fed to satiation twice daily, with fish in all three ponds fed identically at each feeding.

Trial management was based on the ASA 80:20 pond production model. Fish in all ponds were sampled once per month on approximately the same date each month. At the conclusion of the trial, all ponds were drained and the tilapia and silver carp in each pond counted and weighed to determine average fish weight, gross and net production, feed conversion ratio (FCR) and survival. Production input costs were recorded throughout the trial and net income and return on investment (ROI) were calculated at the end of the trial.

RESULTS

Hybrid tilapia were fed a total of 124 days between 18 May and 22 September 2004. Commencement of feeding was delayed for approximately three weeks due to late arrival of the trial feed at the farm. Hybrid tilapia grew from an average size of 79 g to an average weight of 497 g during the 124-day period (Table 2). Gross production averaged 390.1 kg/mu (5,851 kg/ha)² for hybrid tilapia and 31.7 kg/mu (476 kg/ha) for silver carp

¹ 15 mu = 1 ha

² Kg/mu x 15 = kg/ha

ASA FY04 Guangzhou Hybrid Tilapia Trial

(Table 2). Average tilapia and silver carp survival rates were 98.3% and 100%, respectively. Average FCR for red tilapia was 1.63:1. Significant tilapia reproduction occurred in all three trial ponds.

Average feed cost per kilogram of fish growth was RMB 6.52 (\$0.79/kg)³. Net economic return for the 124-day production cycle averaged a negative RMB 158 per mu (-\$287/ha) at a market price of RMB 7/kg (\$0.85/kg) for tilapia (Table 2). ROI averaged -5.1% for the three trial ponds (Table 2).

SUMMARY AND CONCLUSIONS

Hybrid tilapia stock quality was poor and resulted in significant tilapia reproduction. This reproduction reduced the growth of the initial stock and resulted in substantial feed loss to sub-market size tilapia that had no value. Poor fish growth resulted in early termination and harvest of the trial before the tilapia reached the target market size of 600 g. Results of the trial indicate that the trial farm needs to upgrade its hybrid tilapia stock to improve quality. It is also recommended that a predatory service species be added to hybrid tilapia growout ponds in the future to crop tilapia reproduction.

ACKNOWLEDGEMENTS

ASA gratefully acknowledges the Guangdong Provincial Fishery Extension Center and the Nanhai Keda Hengsheng Fishery Co. Ltd. fish farm for their assistance and support for this aquaculture trial.

³ RMB 8.26 = \$1.00

ASA FY04 Guangzhou Hybrid Tilapia Trial

Table 1. Formula for the ASA 32/6¹, soy-maximized feed used in the 2004 hybrid tilapia demonstration feeding trial in Guangzhou, China. Fwusow/Xiamin feed mill in Fujian Province produced the feed in extruded, floating pellet form.

Ingredient	Percent of total
Soybean meal 47.5	52.8
Wheat, SWW	23.2
Wheat middlings	10.0
Corn gluten meal 60%	6.0
Fish oil	3.5
Soy lecithin	1.00
Ca phosphate mono	2.70
Vit PMX F-2	0.50
Min PMX F-1	0.25
Stay C-35%	0.03
Ethoxyquin	0.02
Total	100.00

¹The numerical component of the feed description refers to the percentage of protein and lipid, respectively, in the ration, i.e. 32/6 indicates 32% crude protein and 6% crude lipid.

ASA FY04 Guangzhou Hybrid Tilapia Trial

Table 2. Results of the 2004 ASA aquaculture trial in Guangzhou that demonstrated advanced fingerling to market pond growth performance of hybrid tilapia using a soy-maximized 32/6 feed and the ASA 80:20 production model.

Pond No.	NiT ¹ stocking size (g)	Stocking rate (fish/mu)	No. days fed	Harvest wt. (g)		P _G ³ (kg/mu)		Survival (%)		FCR	Net (RMB/mu)	ROI (%)
				NiT	SiC ²	NiT	SiC	NiT	SiC			
1	79	800	124	486	336	385.2	33.5	99.0	100	1.65	-180	-5.8
2	79	800	124	535	294	413.7	29.4	96.8	100	1.52	- 9	-0.3
3	79	800	124	469	326	371.4	32.3	99.0	100	1.73	-285	-9.3
Mean	79	800	124	497	319	390.1	31.7	98.3	100	1.63	-158	-5.1

¹NiT = Hybrid tilapia nilotica

²SiC = Silver carp

³P_G = Gross Production