

THREE YEAR STUDY DEMONSTRATES ADVANTAGES OF ASA-IM 80:20 TECHNOLOGY AND SOY-BASED FEED FOR GRASS CARP IN COMPARISON TO A TRADITIONAL CHINESE POLYCULTURE SYSTEM

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A three-year series of feeding trials was conducted to demonstrate the production, economic, and environmental advantages of the ASA-IM 80:20 pond technology and soy-based feed in comparison to a Chinese polyculture technology. Comparison trials conducted in 2006, 2007 and 2008 were conducted in a complex of six, 0.8-ha ponds in Jiangsu Province, China. Grass carp and silver carp were the fed and service species in the 80:20 system, with grass carp fed the extruded ASA-IM 32/3 feed, formulated on average with 45% soybean meal and 11% soy hulls. Grass, crucian, bighead and silver carps, plus wuchang bream, were stocked in the polyculture ponds, and were fed a 28% crude protein, local sinking feed together with fresh grass.

In the 2006 trial, total fish production was 15% higher in the three 80:20 ponds (21.89 mt) than in the three polyculture ponds (19.03 mt), and grass carp grew 11.5% larger in the 80:20 ponds (299 g to 2,199 g in 176 days), despite being only 57% as large at stocking as the grass carp in the polyculture ponds. The FCR of 1.05:1 obtained with the 32/3 soy feed was less than half the FCR of 2.8:1 obtained with the combination of local feed and fresh *Lactuca indica* grass. The polyculture ponds required 53% more feed plus 16.35 mt of grass to produce 15% less total fish, and 30% less fed fish, than were produced in the 80:20 ponds.

In the 2007 trial, grass carp production was 64% higher in the 80:20 ponds than in the polyculture ponds. At harvest, grass carp were 22.5% larger in the 80:20 ponds (1,250 g) than in the polyculture ponds (1,021) for the 70-g grass carp stocked in both ponds. FCR in the polyculture ponds with the combination of local feed plus fresh lettuce and sudan grass was 3.47:1, and was nearly three times the FCR of 1.18:1 with the soy-based 32/3 feed. The polyculture ponds required 35% more feed plus 16.2 mt of grass to produce 47% less total net fish production, and 272% less net fed fish production, than were produced in the 80:20 ponds.

The 2008 trial compared the two technologies for the production of 3-year old, >3 kg grass carp. Grass carp production was 42% greater in the 80:20 ponds (6.90 mt/ha) than in the polyculture ponds (4.87 mt/ha). Average grass carp size at harvest was 27.5% larger in the 80:20 ponds (3,283 g) than in the polyculture ponds (2,575 g) for the 1,225-g grass carp stocked in both ponds. The addition of crucian carp and wuchang bream to the polyculture mix only added an average of 735 kg/ha to production at harvest. FCR with the local sinking feed (3.64:1) was twice the FCR with the soy-based 32/3 feed (1.83:1). A net economic return of \$11,450 from the 2.4 ha of 80:20 ponds was the best economic return obtained during the three years of this trial program, and was 21% higher than the economic return from the polyculture ponds, even though feed price for the 32/3 soy-based feed was 85% higher than the price for 28% protein local feed.