



Koi keeping

The Virkon® S Aquatic story

PART ONE

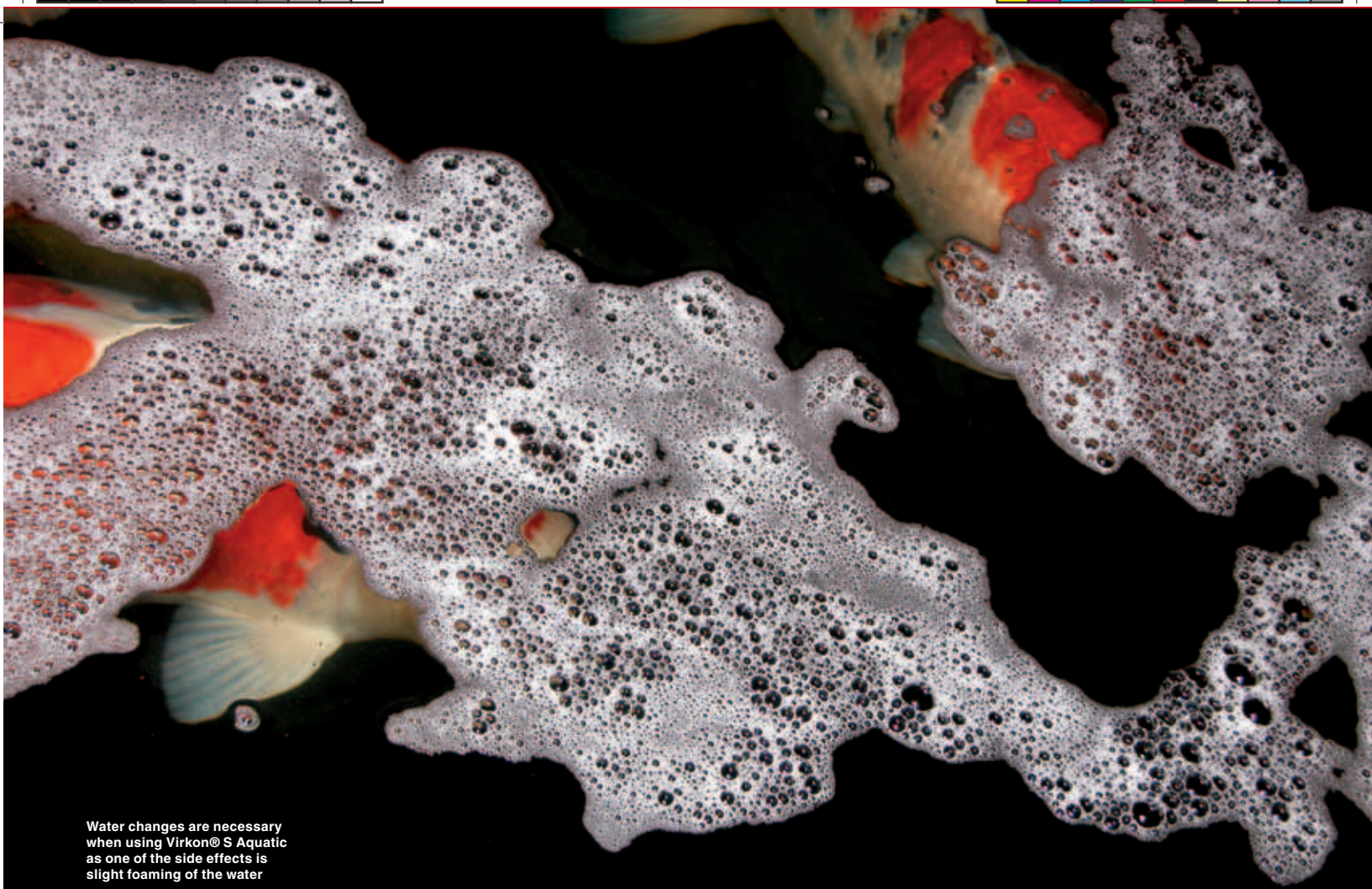
Leading fish vet Professor Ronald Roberts was closely involved with the development of the first in-water pond sanitiser, Virkon® S Aquatic, and used ponds at Koi Water Barn in Kent for the Koi trials – Koi Water Barn MD **Keith Holmes** finds out more...



Keith Holmes

Keith Holmes is manager of Koi Water Barn and has recently finished co-writing his second book, *The Interpet Manual of Koi Health*. His Koi and aquatics knowledge is based on 12 years' experience in the trade.





Water changes are necessary when using Virkon® S Aquatic as one of the side effects is slight foaming of the water

Where did Koi come into the picture?

The use of the technique in farmed fish has now proven itself and been approved by Dupont for their product support. It has been shown not to require Medicines Act approval since it is the water and not the fish that are being treated. When I was advised of the general problems with viruses in Koi, I had discussions with other specialist fish vets, such as William Wildgoose MRCVS in London and Chris Walster MRCVS in Birmingham, and they confirmed that there was a serious risk from both KHV and SVC, which is a notifiable disease. I had seen the same disease that we now know as KHV in carp in Indonesia in 1984, so it is not a brand-new disease.

The first requirement was to determine the toxicity of Virkon® S Aquatic for Koi. I had little doubt about its efficacy since all herpes group viruses are very susceptible to Virkon. They are much more delicate than the very tough IPN virus in salmon. Professor Hardy and I repeated the toxicity work in triplicate in populations of Koi and showed that Koi were even more resistant to any toxic effects than salmon. Virkon® S Aquatic had no pathological effects even up to 12ppm and that was with continuous addition of Virkon® S Aquatic at the appropriate rate, in a running water system, on a 24-hour basis. The Koi noticed the change in the water when it was first added, but thereafter resumed feeding and showed no observable effect and, when slaughtered at the end of the study, had no microscopic damage internally or externally.

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74 Koi June 2006

Jargon buster?

Epizootic refers to a disease which suddenly and temporarily affects a large number of animals.

PCR stands for Polymerase Chain Reaction and is a test used to detect virus particles, live or dead. It is similar to genetic fingerprinting.

Tissue culture is the standard technique used for growing viruses from infected animals using live cells grown in the laboratory from susceptible species.

Biosecurity is the series of techniques involving legislative, physical and chemical means, for example UV light and disinfectants, by which human or animal populations are protected from external pathogens such as bacteria or viruses. An example of a biosecurity measure is when lorries were disinfected during the foot-and-mouth outbreak in the UK.

Lipophilic surfactants are special detergents that destroy the outer membrane envelope of viruses like the Koi Herpes Virus.

As you know, Koi are normally kept in complex recirculation systems with biological filters and protein skimmers, so how would Virkon® S Aquatic be used in such a system?

This has been the biggest problem when investigating the use of in-water sanitisation techniques for Koi. In salmon or trout culture the water is used once and flows through the system to waste. Any new virucide, added at the header tank, continually flows through the system allowing a constant sanitising level. Tests by Dupont have shown that when Virkon® S Aquatic is added to any water system it breaks down quickly and is gone within 24 hours; in the presence of UV light this breakdown is even more rapid. After months of investigation using ponds at Koi Water Barn, the conclusion is that, instead of continuous on-line dosing at 2–4ppm, which is ideal, alternative recommendations have to be made for Koi. This is made even more difficult by the fact that even Dupont's chemists have found it impossible to devise a test kit for such low levels of the product. Fortunately, toxic levels are several times higher than recommended water sanitising levels and herpes viruses are very susceptible to Virkon® S Aquatic. Users have found that, as long as the fish appear bright and the water clarity is slightly better than before, the effect is there.

Dupont Animal Health, in conjunction with Bradan, the fish biosecurity company with whom they work, now recommend the addition of one 5g Virkon® S Aquatic tablet a week per 1,000 gallons of water in a Koi pond with the proviso that 5% of the system water is also changed during this time; this is even more important in summer when evaporation is a risk. This dose ensures a high level of viral sanitisation. The water change is necessary because although almost all of the Virkon® S Aquatic constituents break down to harmless products, a very small amount of a specialised **lipophilic surfactant** is present, necessary to deal specifically with enveloped viruses like KHV. This does not break down as fast so slight, harmless foaming may occur after a few weeks of use with no water change. If there is a suspicion that KHV is present, or for use in a quarantine system, more frequent use (every three days; two to four tablets per 1,000 gallons) with water changes of up to 10% a week are recommended to avoid foaming. ■