

Did Algae Freedom Fighters Win the Cold War?, Part 2

JIM LANE, Editor, Biofuels Digest



This is part two of a two-part piece. [Part one can be found here](#) [1].

By JIM LANE, Editor, Biofuels Digest

The CIA's concern

Microalgae technology remains, today, challenged on scale-up — only a handful of companies are operating at commercial scales, usually making high-margin food ingredients and nutraceuticals. Making algae work at the kind of scales — and costs — needed to enter the vast market for fuels has proven a tough nut to crack.

But it wasn't considered such a far-out venture at the time. Tony Rimmington's five-page report, "Single-cell protein: The Soviet Revolution?", appearing in the June 27th, 1985 issue of *New Scientist*, took it all quite seriously.

In fact, the CIA investigated the technology as far back as 1977, in a Top Secret report called "The Soviet Hydrocarbon-Based Single-Cell Protein Program". It was eventually declassified (in a sanitized form) in 1999, and you can download it [here](#).

"The Soviets have six high capacity petroleum-based SCP production plants in various stages of construction and operation, and two additional plants are reportedly being built," the CIA reported then.

"They appear to be having technical difficulties with the production process, especially in continuous flow fermentation technology, but all of the facilities under construction are expected to be completed and operating by 1980. The estimated capacity of the completed plants is in excess of 866,000 metric tons, possibly one million metric tons annually...equivalent to about 30% of the oil seed meal that could be derived from Soviet harvests of sunflower weed and cottonseed, the major

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oil seed meal crops grown in the USSR.”

The effort, in the end, was a failure. Whether it was the algae or the production technology that failed, we'll never know.

One thing we do know. In 1990, about the only thing that was in plentiful supply were tents, which is where the troops come back from Afghanistan were being housed — a great big ring of tents around Moscow with all those young soldiers needing food now. And it was August, and the cold was coming and there was a housing shortage. You didn't need a CIA report to see that the pressure was building, and that food was at the heart of it, and that there was going to be the devil to pay.

At the time the report was commissioned, the Director at CIA was George H.W. Bush, later the 41st US President and a cold warrior in both the Nixon and Reagan Administrations. There's no reason to suppose the Director read such a technical assessment, but it is reflective of an awareness at the Agency, during that time, of the strategic dimensions in agriculture.

The nexus of agriculture and biological warfare

Biotechnology was of immense interest too. As Rimmington later wrote in “The Soviet Union's Offensive Program,” “throughout the 1970s and 1980s the Soviet Union was successful in developing an offensive biological weapons capability that gave it overwhelming superiority in these weapons over the United States and other Western countries...Most significantly, it developed specially-adapted multiple-warhead intercontinental ballistic missiles for delivery of its biological weapons, designed to totally disrupt civilian activities in targeted countries.”

Within the Soviet Ministry of Agriculture there was the program code named Ekologiya, which employed as many as 10,000 people and included anti-livestock as well as anti-crop weapons aimed at, for example, wheat, rye, rice and corn.

The programs were managed together — the Biopreparat directorate using the single-cell protein program to “serve in part as the cover for Biopreparat's biotech weapons program,” according to researchers writing in “The Soviet Biological Weapons Program: a history.” In their review, Leitenberg, Zilinska and Kuhn noted that a Russian firm called BIOEFFECT announced three strains for sale of *Francisella tularensis*, the microbe responsible for tularemia, or rabbit fever — a potentially fatal bacterial disease. In their advertisement, they noted that while the strains could be used to research vaccines, “they contained cloned factors of virulence” developed at Biopreparat's State Research Center for Applied Microbiology.

In the 1977 CIA report, the connections between the Single-Cell Protein program and the biotechnology developments that powered the Soviet bioweapons program were not explored. However, the CIA, even then, understood the implications of the single-cell protein program on the USSR's chances to meet its food needs and forestall the widespread unrest that ultimately toppled the regime. “One of the prime obstacles confronting Soviet livestock production plans has been a general

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shortage of all types of feeds,” the CIA reported.

“The most acute shortages are concentrated feeds — both high energy and high protein...the Soviets claim to have achieved a 10-30% increase in productivity...with the addition of 5% SCP to basic rations.” The CIA also pointed out that the USSR could have built capacity to provide as much as 2/3 of the country’s entire high-protein feed supplement by 1980.

Those kinds of gains would not only feed the people — it would continue to enable the USSR to divert more labor and capital to infrastructure, industrialization, defense and energy production. It was all based on massive intensification of agricultural production.

Productivity and power

It’s not a new strategy. As the British environmentalist Tony Juniper has observed, “In Roman times, grain production per hectare was one tenth that of today and the average Roman farmer worked 3 hectares. Combined with the increase in grain yields, productivity for a farmer in Iowa is one thousand times greater than in Roman times, and that has freed up Americans from working the land to work in industry, services, transport, research and finance — making the entire modern civilization possible.”

The height of Roman agricultural productivity? According to The Oxford Companion to Classical Literature, the high-water mark was reached in the late Republic and early Empire periods — corresponding with the most rapid period of Roman expansion and the widest projection of Roman power.

It is a pattern that has been seen over and over again. In the rise of Mesopotamian agriculture, grain yields reached 30 bushels per acre in 2400BC — 50 percent higher than the height of Roman times, but had fallen to 11 bushels per acre by 1700BC. “As a result, many of the great Sumerian cities “dwindled to villages or were left in ruins”, according to the environmental author Edward Goldsmith. Indeed, the population of the great Sumerian city-states declined by 60 percent and they all fell under Babylonian rule by 1700BC.

The one-celled freedom fighters

Productivity and power are linked — the lesson of history not lost on the Soviets. For when their productivity fell — so too did their fall from power hasten and hurry. To avoid this fate, the Communists bet their collective and collectivist society on single-celled yeasts and algae. Roles which their barbarian one-celled natures, refusing to be tamed or turned into a new system of cattle feeding, so ill-suited them.

In microorganisms, the Soviets saw sheep suitable for animal husbandry and control. Instead, they ought to have seen one-celled William Wallaces (the Scottish freedom fighter of “Braveheart” fame), gurgling their choruses of “freedom!” as they helped to rip the Soviet system and its biotech programs asunder.

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Biotechnology, it appears, is a continuation of politics by other means. Or so it seemed, in 1990 as now.

What's your take? Please feel free to comment below!

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