FAO Proposes a "New" Plan for Feeding Africa

It will provide massive supplies of fertilizer—and to some it sounds like a repeat of mistakes made in the 1970s

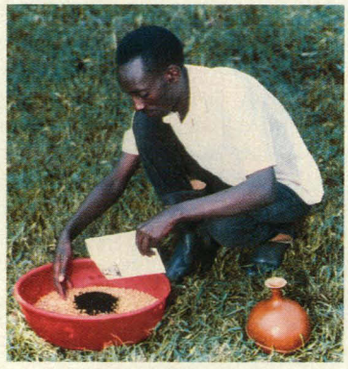
Rome—FOOD PRODUCTION IN AFRICA IS IN crisis. A few years ago the continent was 100% self-sufficient; now it is only 80% so. That food supplies are inadequate is well known. Less known is that the continent is also washing away. Studies from many African countries show that huge amounts of soil are being eroded in agriculture, removing far more nutrients than are ever added back through fertilizer use.

Now the U.N. Food and Agriculture Organization (FAO), putting on a brave face, claims it has a solution to the twin crisis: supplying large amounts of fertilizer as aid-in-kind to countries where the problems are most severe. Critics say the plan sounds like a rerun of mistakes made in the 1960s and 1970s when provision of fertilizers increased Third World debt but did little to boost food production. The FAO denies that this is the case, arguing that it intends to use the chemicals only as a means of putting a brake on the downward spiral. After the initial step of providing fertilizer, FAO agents hope to get farmers' attention and persuade them to use new methods that will sustain agriculture over the long term.

"Aid-in-kind sounds like more of the past," conceded Robert Brinkman, chief of the Soil Resources Management and Conservation Service of the FAO, at a recent meeting the organization hosted here to discuss its new plan. "But where it is used to lift farmers out of their self-insufficiency into a degree of surplus, by a one-time aid-in-kind effort, [it] can set them on a different path."

What Brinkman means is that by rapidly increasing food production—through use of fertilizers and other techniques—African farmers can be persuaded to stay with their fields and improve them, rather than move on as the land becomes increasingly degraded. They hope the dual strategy will stop the continent-wide spiral of agricultural collapse. This plan, which FAO calls the International Scheme for the Conservation and Rehabilitation of African Lands, gets the thumbs-up from some soil scientists. But others think it's just a desperate effort from an organization that isn't prepared to deal with the complexities of food production in Africa.

U.N. Food and Agriculture Organization



Fixing the crop. *An African farmer inoculates legume seeds with* Rhizobium *bacteria, which increase the plant's capacity to fix nitrogen. Uninoculated plants are yellowish, indicating a lack of nitrogen.*

That erosion is taking a severe toll in Africa is indisputable. A recent FAO study of Zimbabwe concluded that each hectare (2.47 acres) of well-managed maize-growing land loses 10 tons of soil per year; small community farms lose 40 tons, and already degraded rangelands, up to 100 tons. The same pattern prevails throughout sub-Saharan Africa. A study of 38 countries by the Winand Staring Center for Integrated Land, Soil, and Water Research in the Netherlands showed that farmlands in all of those countries were losing far more nutrients through erosion than they could afford to apply as fertilizers.

In the past, aid organizations favored a two-pronged approach to the joint crisis of erosion and low food production. They created massive, government-backed soil conservation schemes and provided large amounts of fertilizer. These tactics were temporarily effective, but failed in the long run, partly because farmers saw maintenance of dams and contour banks as a job for government, not themselves. With its new approach, FAO hopes to change attitudes and teach farmers that they can benefit personally by adopting techniques that conserve the soil.

The first step, supplying chemicals, should yield dramatic results. Africa currently uses pitiful amounts of fertilizer—11 kilograms per hectare compared to 700 kilograms per hectare in the Netherlands. At the same time an average crop of grain removes 100 to 150 kilograms of soil. "Nutrients are being mined," says Claude Joly, who runs the FAO Fertilizer and Plant Nutrition Service here. "What is taken from the soil has to be replaced in one form or another," says Brinkman. He cites thousands of studies gathered by FAO over 30 years in more than 50 African countries, showing that 1 kilogram of plant nutrients can produce an extra 10 kilograms of grain, 6 kilograms of oil crops, or 40 kilograms of roots and tubers.

At first, Brinkman says, the FAO scheme may require large inputs of fertilizer—as much as 100 kilograms per hectare. That initial injection, he argues, will provide a quick return in the form of crops that can be eaten or sold, as well as organic residues that can be returned to the soil for the next growing season. Recycling these residues will reduce the need for mineral input in subsequent seasons.

As it provides fertilizer, FAO will instruct farmers in efficient techniques for using it as well as instruction in other soil-conserving practices. They will also provide some other essential supplies, such as *Rhizobium* bacteria, which enable legumes to fix nitrogen. The FAO has already helped several countries set up pilot plants for producing *Rhizobium* and shown farmers how to inoculate seeds with the bacteria.

FAO is also encouraging farmers to use new practices, such as planting grass strips along the contour lines to prevent rain runoff. A new FAO booklet shows trainees how to mark contours with simple equipment and plant grass strips of selected varieties. Such techniques have increased yields by 30 to 50% in Ethiopia.

These measures are no doubt well intentioned. But the $64,000 question is whether they will work. Does the FAO scheme really represent a new departure, or is it new only in the sense that the Emperor's

new clothes were? On that question there is a wide range of opinion in the scientific community—from enthusiasm to outright hostility.

Some soil scientists outside FAO welcome the scheme. "I think it has a very good chance of coming off," said Douglas Carroll of the Commonwealth Agricultural Bureau near London. Mike Hodgson, for many years director of field surveys for Britain's Soil Survey, adds: "In theory there's a logic and a sense in it. But it needs intelligent, sustained, and guided management."

Other agronomists are less sanguine. One common criticism is that FAO is simply exporting to Africa a technology—mineral fertilizers—that has failed in the industrialized nations. But FAO officials point out that the rate of fertilizer use is far higher in Europe than in Africa. "The situations are simply not comparable," says the FAO's Brinkman. "Obesity versus starvation is perhaps an appropriate description of the contrast."

Other, subtler, criticisms also emphasize the differences between Africa and the First World. Michael Stocking, a soil scientist who has worked in Zimbabwe, is worried that FAO hasn't understood the mind set that prevails among African farmers. In the West, Stocking says, the farmer seeks to maximize his profit. In Africa, on the other hand, farmers want to minimize risk—to get by in a harsh environment. "We must understand this question of risk," says Stocking, and develop tactics to avoid it. "In the long run, if you reduce risk you also increase yields, but fertilizers are only a small part of this strategy."

Perhaps the most outspoken criticism comes from Norman Simmonds, a plant scientist at the University of Edinburgh, who has accumulated more than 30 years of experience in the tropics. Simmonds describes himself as "deeply suspicious" of the FAO plan. He argues that African farmers will use free fertilizers and gratefully accept the extra yields—but will not stick with the scheme if they have to pay for supplies. "Small farmers won't risk money on fertilizers because they know it's money down the drain if the rains don't come," Simmonds told *Science*.

Indeed, Simmonds, who describes the FAO plan as a mere "flag-waving exercise," doesn't think the FAO is the appropriate organization for improving food production in Africa. Simmonds, who thinks the solution lies in relatively small research and aid organizations that offer expertise to individual countries, claims the measures needed to improve agriculture in the tropics are simply "too complex to be taken in by bodies such as the FAO." ■ JEREMY CHERFAS

FDA Gets Kessler; NIH Gets Left Out

Washington is a town of deal-making—I'll give you this if you give me that. According to confidential sources, the White House and the Senate made a deal over the nominations of David Kessler to be commissioner of the Food and Drug Administration and Bernadine Healy to be director of the National Institutes of Health.

Kessler, who is at the Albert Einstein College of Medicine in New York, used to work for conservative Republican Senator Orrin G. Hatch of Utah and is Hatch's candidate for FDA. Although he is well regarded, Kessler has no experience in government and there are those in the Administration who would rather see someone with proven political savvy in the commissioner's office.

Healy, a cardiologist who is director of research at the Cleveland Clinic Foundation, has Washington experience as a former deputy in the White House Office of Science and Technology Policy. But her candidacy is plagued by the abortion issue. Healy is said to personally oppose abortion but earned the wrath of Right-to-Life stalwarts when she voted with the majority of an NIH panel examining the ethics of fetal tissue research. The panel concluded that it is morally permissible to use fetal tissue in human research under carefully proscribed circumstances. For that, Right-to-Life groups have opposed her nomination to the top NIH job.

The deal was to treat Kessler and Healy as a package. The Administration would accept Hatch's candidate for FDA and Hatch would assist in getting Healy's confirmation through the Senate. Just before Congress recessed for elections, Kessler's name was formally submitted to the Senate as the Administration's nominee for FDA. However, Healy's nomination has yet to emerge from the White House personnel office. Usually informed sources say they have no idea what went wrong.

■ BARBARA J. CULLITON

Immigration Bill Saves AIDS Meeting

The 1992 International AIDS Conference—recently on the endangered species list—has been saved by the U.S. Congress. The Harvard AIDS Institute, host and cosponsor of the conference, had threatened to cancel the meeting unless the United States changed an immigration policy that restricts entry of HIV-infected foreigners (*Science*, 28 September, p. 1495). Buried in a set of amendments to the new Immigration and Nationality Act—approved in the hectic final hours before Congress adjourned—is a clause that should do just that. Last week, AIDS Institute officials proclaimed the conference back on track.

The problem stemmed from congressional meddling with a list, maintained by the Public Health Service (PHS), of "dangerous, contagious diseases." The Immigration and Naturalization Service can use the diseases on the list as a reason to refuse visas to foreign visitors. In June 1987, Congress adopted legislation introduced by Senator Jesse A. Helms (R–NC) directing the PHS to add AIDS to the list. Activist groups were outraged, arguing that classifying AIDS with highly infectious diseases like tuberculosis was totally inappropriate. PHS officials claimed they had no choice.

Frustration over the restrictions peaked earlier this year when immigration officials would not guarantee visas to HIV-positive people planning to attend the sixth international AIDS conference in San Francisco (*Science*, 6 April, p. 26). Scientists from around the world threatened to boycott the meeting, prompting federal officials to create a special 10-day visa that individuals attending scientific conferences could obtain without revealing whether they were HIV-positive. This move forestalled a boycott, but congressmen like Representatives J. Roy Rowland (D–GA) and Henry A. Waxman (D–CA) began looking for a legislative mechanism to undo the effect of the Helms amendment.

In the end, Representative Barney Frank (D–MA) and Senator Alan K. Simpson (R–WY) agreed to include language in their immigration bill that would do the trick. The new legislation eliminates the list of "dangerous, contagious diseases" and orders PHS to create in its place a list of "communicable diseases of public health significance." A spokesman for PHS would not speculate on which diseases would be on the new list, but Alan Fein, executive director of the Harvard AIDS Institute, says he's confident that AIDS will not appear on the final list when it appears sometime next year. This will bring the United States in line with most other nations that place no restrictions on the movements of HIV-infected individuals. ■ JOSEPH PALCA