

cities of the Sun Belt.

The new work could have both local and global implications. In the Southwest, the clam counts could help environmentalists secure greater water flows to the delta to restore its species. "You need numbers to negotiate with and litigate with, and [Flessa's work] gives us numbers," says environmentalist David Hogan of the Tucson-based Southwest Center for Biological Diversity, which has been active on the issue.

The clam research also offers a dramatic example of how the methods of paleontology can be used to address environmental problems elsewhere, suggests Walker. Techniques like Flessa's and Kowalewski's can provide quantitative historical baselines even when long-term ecological monitoring cannot, she says. "Applying methods like these can give you a numerical sense of the scale of what has happened and then a metric, or benchmark, for attempting remediation," says Walker.

To Flessa, the numbers provide mute testimony on "what has been lost" during 70 years of aggressive water management in the region. He says that the federal dam builders in the Southwest too often ignored the costs of irrigating fields and slaking the thirst of sprawling desert cities. "Now," he says, "we're providing some quantitative assessments of those impacts. That they're huge will help, I hope, to sharpen future policy."

—MARK MURO

Mark Muro writes from Tucson, Arizona.

## PLANT BIOTECHNOLOGY

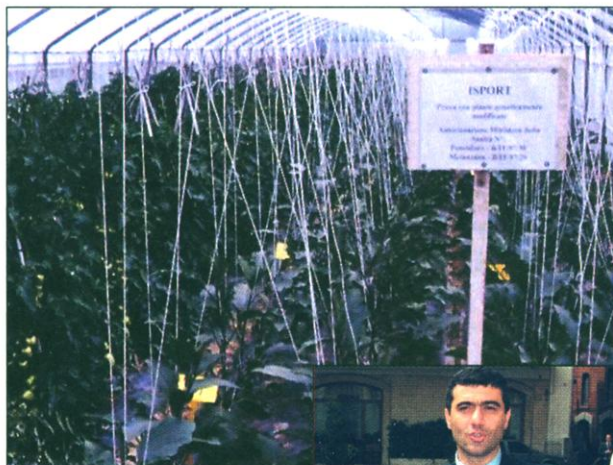
### Italian Scientists Blast GMO Restrictions

**COPENHAGEN**—While plant scientists around the world celebrate the complete sequence of the genome of the mustardlike plant *Arabidopsis thaliana* (see p. 2054), embattled colleagues in Italy are protesting new rules that bar all field trials involving genetically modified organisms (GMOs). The researchers hope to turn the prevailing tide by bringing their plight to the attention of colleagues around the world and exerting pressure on their government through a petition drive. "It makes no sense to do research related to agriculture if field tests are forbidden," says molecular biologist Angelo Spena of the University of Verona.

Biotech critics have had a field day in Europe, where resistance to transgenic crops has influenced policy and crimped research funding (*Science*, 4 February, p. 790). But "only in Italy [are individual scientists] being penalized as a consequence of public concerns," says biologist Roberto Defez of the National Research Council in Naples. Plant researchers aren't the only

ones crying foul. "The issue reaches far beyond biotechnology," claims physicist Giorgio Benedek of the University of Milan-Bicocca, who cites "a general concern in Italy about this antiscience attitude within the government."

At the center of the controversy is Agriculture Minister Alfonso Pecoraro Scanio, a Green Party member who took office last April. A longtime critic of transgenic crops,



**Lying fallow?** Agriculture Minister Pecoraro Scanio (right) is clamping down on GMO field trials.

Pecoraro Scanio claims that GMOs pose a threat to human health and the environment. His first strike at research came in July, when he informed the ministry's chief research coordinator, Francesco Salamini, that funding for projects at 23 institutes under the ministry—which carry out the bulk of the country's ag-biotech research—would only flow after a written declaration from researchers pledging that they would not conduct field trials of GMOs.

The next blow came in September, when Pecoraro Scanio issued a new requirement for long-term projects approved since 1996, many involving ongoing or planned field trials of GMOs. According to Defez, the minister "asked individual scientists to modify their original research proposal to remove every aspect concerning use of GMOs." Only those who complied had their funding renewed. One victim, the first-ever field trial on grapes engineered to taste better, has been halted in Sicily. Such a policy appears to conflict with European Union law, which permits field trials of genetically modified crops that meet restrictions such as adequate safeguards against the spread of transgenes to wild relatives and unaltered crops.

The ministry has also put the kibosh on new research involving GMOs, having declined to approve any proposals since July. According to Defez, a commission composed of representatives from several ministries, including Agriculture, that is responsible for approving field trials "simply postpones applications until it's too late for planting." Many plant biotech lab studies are in vain if not followed up with fieldwork, claims Spena, who says it would be ridiculous to spend years and considerable funds on creating transgenic plant varieties, only to abandon them because of a flawed policy.

Defez and two colleagues have drafted a petition highlighting their plight. Published on 5 November in the financial journal *Il Sole 24 Ore*, the petition has garnered more than 1000 signatures so far, including all major Italian scientific societies and notables such as Nobel Prize winner Renato Dulbecco of the Institute for Biomedical Technologies in Milan. Late last month, the American Phytopathological Society became the first international society to sign on.

The Agriculture Ministry insists that scientists are blowing the situation out of proportion. "GMO research is supported in Italy, except in open field trials," says ministry spokesperson Triantafillos Loukarelis. Scientists, however, assert that Pecoraro Scanio is using the Greens' political leverage to force other government ministers to back his anti-GMO policies. "As a Green fundamentalist, he is blackmailing the rest of the government who depend on the Green vote," contends Spena, who says any politicians who cross Pecoraro Scanio risk bringing down the government if the Greens were to pull out. "An open society cannot allow science to become subject to the whims of individual ministers," Spena says. The fight could continue until the next Italian election, expected in summer 2001. "If the minister retains his position," predicts Defez, "we would see a regular exodus of scientists in biotechnology to other countries or other fields of research."

—LONE FRANK

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