# EU plant programs wither under Framework V

The sequencing of the model plant *Arabidopsis thaliana* has not been earmarked to receive further funding from the European Union (EU). Neither has research on apomixis, the phenomenon of asexual seed production that could have an enormous impact on farmers in developing countries by ending dependence on hybrid seed production. Plant biotechnologists fear further cuts in funding over the next four years, but EU officials deny political motives behind the move.

Framework V is the EU's program under which grants are awarded for research and technology development from 1998 to 2002. In September, following a June invitation to submit proposals, the EU issued the "main priority list" of projects that will probably be funded. Although its predecessor Framework IV (1994–1998) provided € 75 million in subsidies to 45 plant biotechnology projects, very few plant biotechnology projects are on the list for Framework V. "There is the feeling that plant scientists didn't do as well as other disciplines," says Mike Bevan, leader of the *Arabidopsis* sequencing project at the John Innes Centre (Norwich, UK).

Under Framework IV, 16 European laboratories received a total of € 12.5 million for the sequencing of *Arabidopsis*—eagerly anticipated because most of the functions found in higher plants are present in *Arabidopsis*, yet its genome is about one-tenth of the size of those of higher plants. During Framework IV, chromosome 4 and part of chromosome 5 was sequenced. Although only chromosome 5 remains to be completed by the EU in order to satisfy its part of a global sequencing agreement with the US and Japan, lack of money has already halted sequencing in several laboratories, including Bevan's.

Three *Arabidopsis* projects in functional genomics are on the priority list, but whereas some researchers think that funding functional genomics is more important because it's more goal-oriented than sequencing, Bevan doesn't see the logic of this. "We expect serious problems," says Bevan. "It's extremely difficult to find other financiers." It remains unclear whether the Japanese and American institutes are capable of taking over chromosome 5. If they are not, sequencing will most likely be completed by companies that won't release the information freely.

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The plant embryology network also appears to be heavily hit by cuts. Whereas six plant embryology projects received € 15 million in Framework IV, none are on the current priority list. This includes research into apomixis, which allows for asexual reproduction of grain so that next-generation seeds are exact clones of the parent plant. Promotion of apomixis could have a huge impact in developing countries as it would allow seeds to be saved from one crop cycle to the next without any loss of hybrid traits through the normal process of cross-fertilization. Without EU funding, this type of fundamental research could be lost to US institutes, says Sacco de Vries from Wageningen University (the Netherlands). "A quite sizeable infrastucture that is capable of supporting the European seed industry could disintegrate."

**Plant biotechnology may have missed out because of the shift in the EU's focus from technology- to application-based programs.**

Public opinion in Europe concerning transgenic crops is dramatically different from what it was at the start of Framework IV, and rumors among researchers and in the English press suggest that this has influenced the outcome of the first call for Framework V proposals. But EU officials in Brussels deny this link. The coincidence, they say, is merely the result of more proposals than in the previous period and fewer proposals receiving more funding. In Framework IV, 513 out of 2,155 proposals (25%) were funded. But there have already been almost 1,800 proposals in the life sciences, only 10–15% of which are likely to be funded.

Moreover, plant biotechnology may have missed out because of the shift in the EU's focus from technology- to application-based programs, with researchers neglecting to fully address new socioeconomic criteria.

Framework IV's biotechnology category, which had a budget of almost € 600 million and evaluated proposals under scientific quality and management criteria, has been axed. Plant biotechnologists must now submit proposals under one of the six life science "key actions"—sustainable agriculture; fisheries and forestry; the aging population; infectious diseases; food, nutrition, and health; environment and health; and cell factory—or a separate "generic research" category.

In this first round, competition was stiff because most plant biotechnologists submitted proposals under either the € 400 million "cell factory" key action or "generic research." The production of substances with a high added value, like medicines, flavorings, and bioplastics, all come under the cell factory category. But out of 36 proposals on the main priority list, only 3 are for plant biotechnology, the rest being lost to microbiologists and medical biologists. And plant applicants in the "generic research" category, which supports technologies in rapidly emerging sectors and those with high potential for the future, faced tough competition from genomics.

As a result, De Vries intends to submit his proposal on somatic embryogenesis under the "sustainable agriculture" key action, for the November 15 second call. "All plant biotechnologists are looking for ways to get out from cell factories," says De Vries. "But if everybody puts their research under the two [alternative] key actions, sustainable agriculture [€ 520 million] or food, nutrition, and health [€ 290 million], there will be a stiff competition there. So the discussion is already coming back to whether it's not better to stay in cell factories."

Food scientist Wim Saris, Dutch member of the external advisory group on food, nutrition, and health, warns plant scientists to be clear about how they plan to contribute to the socioeconomic problems defined in each category. "There were several scientifically excellent proposals in plant-biotechnology," says Saris. "But in the second stage, where they were evaluated on social and economic criteria...they didn't make clear the purpose of the research."

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