strategy in many circumstances. The need for protection of old-growth forests should not, however, be used as an argument against afforestation, reforestation, or appropriate use of forest resources as a means to slow the increase of atmospheric carbon dioxide.

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Response

We are glad to see that both replies agree in principle with our conclusion. Here we provide some additional clarifications.

Marland and colleagues refer to a proposal often mentioned in which carbon credits for afforestation and reforestation would be awarded for areas that were bare of forest in 1990, to avoid incentives that are not in the spirit of the Kyoto protocol. However, this time limit must be approved by national governments, no time limit exists for the Clean Development Mechanisms (CDMs, reforestation projects in developing countries), and the time limit for future commitment periods has not been set. During the climate conference in The Hague in November [the sixth Conference of the Parties (COP6)], 1990 was not mentioned for CDM projects in the "Note by the President of COP6," and 2000 was under discussion for some activities.

As to the commitment by countries to the spirit of the Protocol, the conference demonstrated that industrial nations are not willing to accept a debt in afforestation-reforestation-deforestation activities. They requested to write off such debt or to balance it by other activities, such as management of plantations. To avoid accounting of business as usual, the president of COP6 suggested that carbon gains by forest management be discounted by 85%. But this discount would also hold for debits (decreasing carbon stocks due to management). Thus, converting 100 hectares of primary forest would only count as 15 hectares. The reality of negotiations was different from the vision of Marland *et al.*, and it remains to be hoped that the spirit of Kyoto emerges again in the continuation of COP6.

In our Perspective (*1*), we avoided the problems associated with defining "forest management" by taking an example of forests exposed to repeated ground fires (*2*). However, in response to Borden, ground fires have a similar effect as thinning operations (*3*). The Intergovernmental Panel on Climate Change (IPCC) special report describes in detail carbon losses after harvest (*4*). The net carbon balance of a clear-cut forest was still zero 14 years after harvest despite massive growth of a regenerating forest (*3*). In terms of total effects on the atmosphere, it is expected that afforestation and reforestation may decrease atmospheric CO_2 concentration at most by about 40 parts per million (ppm), but deforestation and conversion of previously nonmanaged forests (that is, forests in which wood extraction has not taken place) to plantations is expected to increase atmospheric CO_2 by 100 to 200 ppm (*5*). Thus, preventing deforestation, degradation, and conversion would be much more effective in stabilizing atmospheric CO_2 concentrations than reforestation.

How do sources of carbon and forms of carbon storage stack up in forest management decisions?

We agree that a complete carbon budget should include the energy cost of wood substitutes. But differences in mean residence time (average lifetime of products) become important. Forest products have a mean residence time of 10 to 15 years versus decades and centuries in old trees and in soils (*6, 7*). A molecule of CO_2 assimilated today is expected to have a longer lifetime as organic matter not in fast-rotating plantations and their products, but in unmanaged forests and undisturbed soil (*7*). It takes time and protection from disturbance to pipe carbon through the ecosystem pools until it reaches a nonlabile state. If rotation time of forests is increased, there is not enough time to deliver carbon to nonlabile pools (*7*).

With regard to fuel substitution, Canadian studies have shown a negative carbon balance (*8*) due to the cost of transport. Wood as an energy source would only save carbon if it were transported for other reasons. It will depend on the carbon cost of transport whether biomass is profitable as a renewable energy source.

Lastly, we agree with Marland *et al.* that "the carbon balance is only one of many criteria that will influence forest management decisions," and decisions are made on the basis of volume growth and not with respect to a net ecosystem carbon balance (*8*). This is why we think a focussed view is needed to define a tolerable window that cannot be abused. Timber products will be needed in the future and should be produced on plantations. At the same time, old-growth unmanaged forests have a separate, important function in the global carbon cycle and in biodiversity.

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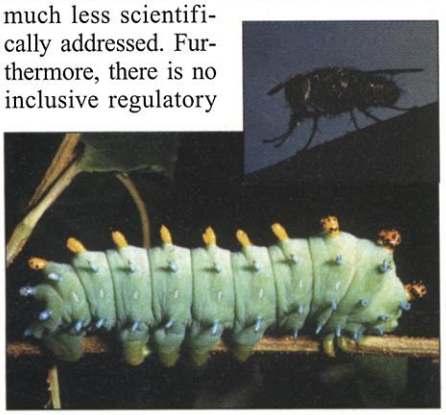
Safety Data Crucial for Biological Control Insect Agents

In our Policy Forum entitled "Biocontrol of invading species—risk and reform," we discussed past and potential environmental problems (harm to nontarget native species) associated with biological control practice (*Science*'s Compass, 16 June, p. 1969). We argued for a more selective, ecologically safer use of biological control and for safety testing of biological control of insect agents, and we made suggestions for revising regulations and review processes (modeled largely on biological control of weeds) to safeguard this valuable pest management tool and the environment.

In a letter commenting on our article, David Pimentel says that we "do not make the essential ecological assessment of alternative strategies and trade-offs [to using biological control]" (Letters, 11 Aug., p. 869).

We agree that making such comparisons is crucial, but there can be no such assessment unless safety data related to biological control and other strategies are available. The central point of our argument is that the ecological safety of organisms for the biological control of insects has rarely been considered, much less scientifically addressed. Furthermore, there is no inclusive regulatory requirement for such safety data. We need to move beyond old arguments to scientific and regulatory assessments that judge the most appropriate pest control measure, biological or otherwise. Concern for native species and the environment should weigh heavily in such decisions.



CREDIT: (TOP) RONALD M. WESELOH/CONNECTICUT STATE AGRICULTURAL EXPERIMENT STATION; (BOTTOM) DAVID WAGNER, UNIVERSITY OF CONNECTICUT.

The tachinid fly, *Compsilura concinatta* (top), introduced to North America for gypsy moth biological control, attacks and kills caterpillars of native moths such as the Cecropia moth, *Hyalophora cecropia* (bottom) (*1*).

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Ritalin Tests for Preschoolers

Eliot Marshall's News Focus article "Planned Ritalin trial for tots heads into uncharted waters" (17 Nov., p. 1280) describes a clinical trial that begins in December 2000, the Preschool ADHD Treatment Study, that will assess the efficacy and safety of methylphenidate (Ritalin) on children 3 to 6 years old. Although the article provides a good description of the background of the study and its overall design, it contains an inaccurate statement regarding methylphenidate dosing used in the initial stages of the study that could cause concern on the part of families who might participate. Marshall mentions that "only very low doses of [methylphenidate] will be used in the initial stage—so low that a planning memo calls the level 'homeopathic.'" This statement is incorrect, for it suggests that all the dose levels would "have no effect." As strongly recommended by the National Institute of Mental Health's Data Safety and Monitoring Board, only one of the four methylphenidate doses used in the initial stage will be very low—so low that the authors of two previous studies would consider it "homeopathic." This will allow us to test whether this single very low dose might work better in a preschool child.

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CORRECTIONS AND CLARIFICATIONS

News Focus: "In search of biological weirdness" (10 Nov., p. 1077). Bdelloid rotifers were mistakenly described as being single celled.

News of the Week: "New site suggests Anasazi exodus" (3 Nov., p. 914). On the map accompanying the article, the state of Utah is incorrectly marked as Nevada.