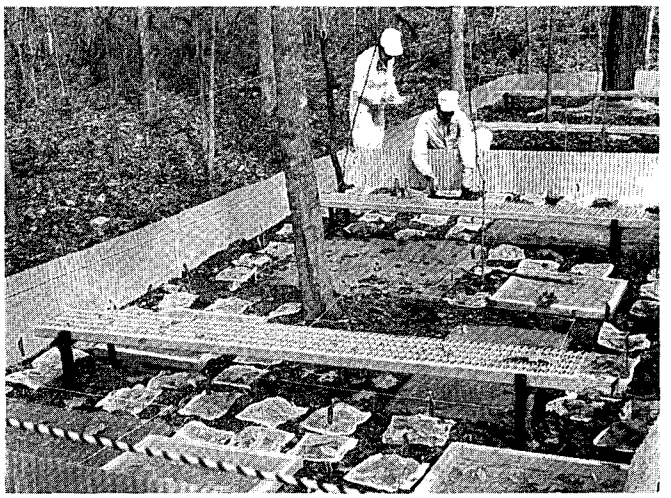
inside fusion reactor plasmas. Researchers, led by Stan Milora and Chris Foster, developed a pellet injection method for firing frozen hydrogen pellets into fusion plasmas to maintain the plasma densities. This refueling technology was subsequently adopted for tokamaks in Europe and the United States.

International fusion research involved many countries, DOE facilities, and Laboratory divisions. A major fusion research problem during the late 1970s was the action of the fusion plasma when it escaped the magnetic field and met the first wall of the vessel containing it. Would it damage the wall? Would it sputter impurities from the wall back into the plasma and "poison" it by radiating away the energy needed to sustain the fusion reaction?

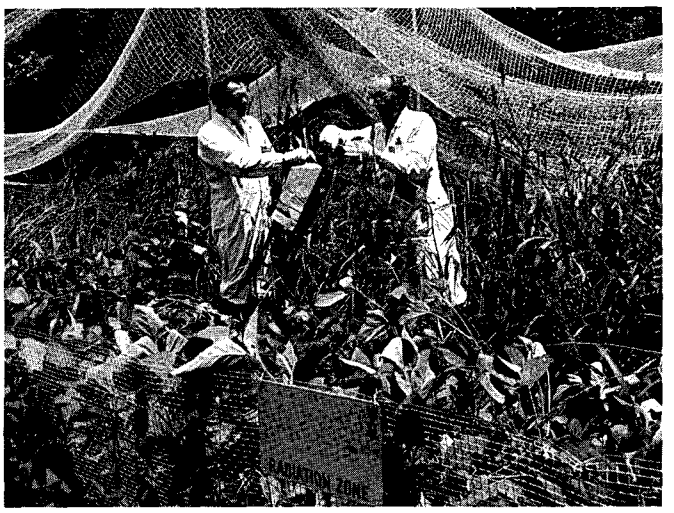
To coordinate studies of these and related questions, the Laboratory joined with four other DOE laboratories in a "first wall interactions" group. Bill Appleton and Jim Roberto, both of the Solid State Division, Bob Clausing of the Metals and Ceramics Division, and Bob Langley and Peter Mioduszewski, both of the Fusion Energy Division coordinated "first wall interactions" studies at the Laboratory.

Other fusion research advances during the ERDA years included the neutral beam technology developed by Bill Morgan's team to heat plasma inside a fusion device. The neutral beam technology helped Oak Ridge's ORMAK and Princeton's tokamak achieve record temperatures that approached what was needed for self-sustaining fusion reactions. Investigations of huge superconducting magnets for containing fusion plasmas began under Hugh Long, Martin Lubell, Fred Walstrom, and William Fietz, leading to selection of the Laboratory in 1977 to build the international Large Coil Test Facility. Managed by Paul Haubenreich, this facility would test supercold magnets, weighing 40 tons each, that were manufactured both in the United States and abroad.



Gladys Dodson and Marvin Shanks check leaf decomposition and isotope release as part of a field ecology study.

The fusion program also needed large amounts of specialized atomic cross-section data to understand complex plasma interactions. This need was met by a nationally coordinated program started in the Physics Division in 1956 by Clarence



Ernest Bondietti and Roger Dahlman work in the transuranics garden to study the activity of actinides in the environment.