

ed vineyard conditions at Beltsville. These clones were also evaluated for transmittance of resistance against black rot.

Individual clones have been crossed with a black-rot susceptible cultivar, mainly *V. vinifera*, and the seedling progenies screened under rigorous greenhouse conditions. Seedlings were grown in 2" pots and at the 5 to 15 leaf stage were inoculated with conidia (25,000 or more per ml) from culture. Inoculated plants were held 40 to 60 hours under light mist and symptoms appeared 10 to 21 days later. Susceptible progenies and some of the less resistant wild x susceptible progenies have approached 100 percent infection following two sequential inoculations.

In general *V. rupestris* is a rather poor source of resistance. Clusters are

small, flowering is very early, and experience with the hybrid-direct-producers of France has shown that it is difficult to eliminate the characteristic taste of this species.

V. cinerea is a far better source of resistance to black rot. It is also late blooming and large clustered, but small berried. The primary fault with this species is that a portion of the seedlings are genetically defective.

The significant information gained is that there is extensive variation among wild vines, even within species, in their ability to transmit dominant high resistance (immunity under test conditions) and great variation in the percentage of defective seedlings in the *V. cinerea* hybrid progenies.

Of the 200 clones tested, less than a dozen have been selected for further breeding.

Establishment, Preservation and Utilization of Fruit Germplasm in Romania

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The need for a rich germplasm stock to be used in breeding programs on the one hand, and the difficulty of preserving and properly using this stock on the other hand, have called for the reorganization of the pomological collection in our experiment stations. It involved the concentration, on a limited area, of a large number of cultivars, from the wild ones to the more recent ones, to serve as parental material for our own research workers. Of course this collection is available for exchange of pollen, seeds and scions with fruit breeders in other countries.

The evaluation of the collection should provide information about new sources of characters that are present-

ly of special interest—increased nutrient value, especially vitamins and minerals; immunity or resistance to pests and diseases; and improved handling, storage and processing qualities. The collection could also be valuable for the study of the variability or the heritability of these characters.

There is now a single pomological collection for the whole of Romania. Each species is planted in the region most favorable for that species. The collection includes species, native cultivars and foreign cultivars grouped according to the time of ripening. All trees are grafted on seedling rootstocks, 4-6 trees per clone. The collection includes:

	Native	Foreign	Species	Total	Station
Apple	280	335	35	650	Voinesti
Pear	166	330	54	550	Cluj
Plum	235	203	62	500	Pitesti
Almond	69	130	1	200	Murfatlar
Peach	42	450	8	500	Murfatlar
Apricot	80	230	10	320	Tuzla
Cherry	180	220	8	408	Bistrita & Pitesti
Total	1052	1898	178	3128	

With the small fruits, nuts, and some other species included there are over 3600 clones established in the collection.

This collection is a rich source of germplasm for breeders, geneticists, biochemists, phytopathologists, etc. It

is a living museum of the history of fruit species and cultivars, showing their evolution from the wild species to the latest cultivars. Each breeder, at the beginning of his career, should work at least 2-3 years in the pomological collection.

Interspecific Hybridization in Citrus Sciions

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The major market classes of citrus fruits grown in the U.S. are: orange (*Citrus sinensis*), grapefruit (*C. paradisi*), tangerine or mandarin (*C. reticulata*), lemon (*C. limon*), and lime (*C. aurantifolia*). The tangelo (*C. paradisi* X *C. reticulata*) and the tangor (*C. reticulata* X *C. sinensis*) are interspecific hybrids that are commercially produced.

The five species mentioned above have been recognized by Swingle, Hodgson, and Tanaka. Within the genus *Citrus*, Swingle (1943) recognized 16 species and Tanaka (1969) recognized 159 species. Many cultivars of citrus reproduce by apomixis (nucellar embryony) with only an occasional zygotic embryo. The fact that many cultivars produce seedlings that are genetically like the seed parent has encouraged systematists to

give species rank to a large number of cultivars and probable hybrids. The species problem as viewed by citrus scientists around the world is complex and few agree totally with any system. However, most U.S. scientists favor the Swingle system more than the others.

Most of the scion breeding in recent years has involved *C. sinensis*, *C. paradisi*, *C. reticulata*, and *C. grandis* (the large-fruited pummelos that have little commercial significance in the U.S.). The cultivars of oranges (*C. sinensis*) and grapefruit (*C. paradisi*) produce few, if any, zygotic seedlings, even when control pollinated. Only zygotic seedlings have been reported from pummelo progenies. The cultivars of mandarin (*C. reticulata*) vary from completely zygotic to completely