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R. J. Hecker and coworkers demonstrated that sugarbeet (*Beta vulgaris* L.) pollen could be stored in liquid nitrogen vapor phase (-160°C) (LN) for 1 yr and remain viable. In this study we demonstrate that similar pollen, stored for 17 years in LN was able to successfully pollinate sugarbeet and produce viable seed. There were significant differences in the moisture contents of the stored and fresh pollen, but two viability staining tests showed no significant differences between stored and fresh pollen, and differences in pollen tube germination were small. Long-term storage of pollen provides opportunities for many uses both in sugarbeet genetic resources preservation and plant breeding (which have considerable overlap). In a heterozygous crop such as sugarbeet, collected pollen would be a way to preserve superior, individual genotypes. Pollen from high value inbred parental lines needed for recurrent backcrossing could be preserved. This would have applied plant breeding applications and be useful in developing populations to facilitate genetic analyses. Collection and storage of pollen could be a way to obtain a more representative sample of the genetic diversity in wild populations. With restrictions on the international transport of seed becoming increasingly stringent, pollen could be an alternate way to distribute genetic resources or cultivated beet germplasm internationally.