HUBBARD, J. C.*, and J. S. GERIK. USDA, Agricultural Research Service, 1636 E. Alisal St., Salinas, CA 93905. Temperature optima of California isolates of *Polymyxa betae*.

Isolates of *Polymyxa betae* were collected from sugarbeet production fields in California. Cultures of these isolates were initiated using multiple resting spore clusters collected with a micromanipulator and added to pots of sterile sand in which sugarbeet seedlings were grown. Dried root tissue from these plants, containing resting spores of *P. betae*, was used to inoculate sugarbeet seedlings growing in 4" pots. Inoculated plants were grown in growth chambers for 8 weeks at 16, 20, 24, or 28 C, and root samples taken from the pots were assayed for the amount of infection by *P. betae* using a modification of the procedure developed for quantification of vesicular-arbuscular mycorrhizae. The data indicate that the highest infection rate for *P. betae* occurs near 24 C, but one isolate from the Imperial Valley in California showed bimodal temperature optima, suggesting a mixed population of *P. betae* in that isolate. Further studies were conducted using single resting spore isolates of the above cultures established by the agar disk method and maintained on sugarbeets growing in sterile sand in a growth chamber. Zoospores and resting spores collected from these cultures were used to inoculate further temperature experiments. Zoospores were able to infect sugarbeet roots at 16C, and infection spread at this temperature, but resting spores required higher temperatures for germination.

GERIK, J. S.*, and STEVEN R. TEMPLE. USDA, Agricultural Research Service, 1636 E. Alisal St., Salinas, CA 93905. and Agronomy and Range Science, University of California, Davis, CA 95616. - Comparison of direct seeding and seedling transplanting on yield loss in sugarbeet due to rhizomania.

Fumigation with 1,3-dichloropropene has been a successful control strategy for rhizomania in the spring plant - spring harvest area of California. The fumigant apparently reduces the soil population of *Polymyxa betae* to low levels, thereby protecting the taproot until the time when this tissue is no longer susceptible. Only primary tissues, the epidermal and cortical cells, are susceptible to infection by *P. betae*. As the sugar beet tap root emerges from the seed and grows through the soil it is susceptible and may be killed, until the cortex is sloughed and secondary growth commences. By the end of the summer feeder roots may be nearly 100% infected, but as the soil temperature drops in the fall of the year, infection is much reduced and the infected sugarbeets will recover and produce a near normal crop the following spring. Experiments were conducted to determine the effect of seedling transplanting on yield loss caused by rhizomania. Four sugarbeet varieties, susceptible or tolerant, were planted or transplanted in a split plot in a field known to be heavily infested with the rhizomania pathogens. Observations made during the growing season indicated that the transplanted sugarbeets remained healthier than the direct seeded ones. The experiment implies that transplanting sugarbeets may diminish the amount of damage caused by rhizomania and that transplanting could be a substitute for soil fumigation in an integrated control strategy.