

RECENT FOREIGN LITERATURE ON
POTATO RESEARCH

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Inter-Regional Potato Introduction Station

by

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I GENERAL

Anon. 1952. Seed Potatoes. (The maintenance of pure, healthy and vigorous stocks).
Dept. Agric. Scotland. H. M. Stationary Office, Edinburgh.
Pp. 107.

This Bulletin deals with (1) methods of identifying the growing plants; (2) descriptions of commercial varieties currently grown in Scotland and also of varieties seldom or no longer grown; (3) diseases and pests, reference being made to varietal reactions; and (4) schemes for the inspection of seed stock production.

Bald, J. G. and Oldaker, C. E. W. 1950. Testing and maintenance of potato clones.
Emp. Jour. Exp. Agric. 18: 95-104.

It is emphasized that clonal variations should receive more attention in potato variety testing.

Feistritzer, W. 1952. Die Selbstungsanalyse, eine Voraussetzung für die Kreuzungszucht der Kartoffel. (The analysis of selfing results, a prerequisite for potato breeding by hybridization).
Z. Pflanzenzucht. 31: 173-195.

Segregation for skin and flesh colour, tuber shape, time of maturity and resistance to late blight, scab and Colorado beetle were studied in selfed progenies of several German varieties and in crosses between such progenies. The data show that it will be possible to predict the results of crossing a given pair of varieties from their behaviour on selfing.

Hagberg, A. and Tedin, O. 1951. Inter- and intra- clonal crosses and inbreeding in potatoes.
Hereditas 37: 280-287.

There is a considerable depression of vigour even in the first generation of inbreeding. Intra - clonal crosses do not show any stimulating effect on vigour and reciprocal inter - clonal crosses show marked differences.

Hawkes, J. G. 1944. Potato collecting expeditions in Mexico and South America. II. Systematic classification of the collections.
Imp. Bur. Pl. Breed. & Genetics, Cambridge. Pp. 142.

_____. 1945. The indigenous American potatoes and their value in plant breeding.
Emp. Jour. Expt. Agric. 13: 11-40.

The reactions of indigenous American potatoes to late blight, virus diseases, wart, scab, root eelworm, Colorado beetle, flea beetle and leaf hopper are mentioned. Information concerning the physiological properties and chemical composition of such potatoes are also given and the possibilities for breeding with them are discussed.

Hawkes, J. G. 1947. Some observations on South American potatoes.
Ann. Appl. Biol. 34: 622-631.

The taxonomy, distribution and cyto-genetic features of wild and cultivated tuber-bearing Solanum species are discussed with particular reference to the use of such species in practical breeding work.

_____. 1951. Cinco conferencias sobre el mejoramiento de la papa. (Five lectures on potato breeding).
Inst. Nac. de Agricultura (Venezuela) Bol. Tec. No. 1.
Pp. 53.

The lectures relate to the history of the potato in South America, species of the section Tuberarium and their evolution, and potato breeding problems in Colombia and Venezuela.

Hutton, E. M. 1948. Potato improvement in Australia.
Jour. Austral. Inst. Agr. Sci. 14: 71-76.

Prien, H. G. 1949. Welche Kartoffelsorte ? (The choice of potato variety).
Neue Mitt. Landw. 4: p. 167.

The characteristics of the important West German potato varieties are mentioned.

Rudorf, W. and Ross, H. 1952. Grundlagen der Kartoffelzuchtung.
(Bases of potato breeding).
Zuchter 22: 119-127.

The importance of a knowledge of the genetical constitution of parents as revealed by selfing is emphasized. It should be possible to breed desirable hybrids by crossing inbred lines, a method which will be particularly useful in the case of polygenically inherited characters.

Stanton, W. R. 1952. Bolting, a vegetative variation in the potato.
Heredity 6: 37-53.

In its origin and determination, bolting ("Giant Hill") differs from any known type of nuclear and cytoplasmic inheritance.

Warka, M. 1951. Zur selbststerilität von Solanum chacoense Bitt.
(On the self sterility of S. chacoense. Bitt).
Z. Pflanzenzucht 30: 309-314.

Grafting on tomato, treating seeds with colchicine and dual pollination (first with S. tuberosum pollen and then with S. chacoense) help in overcoming self-sterility in some clones of S. chacoense.

Toxopeus, H. J. 1952. Over de mogelijke betekenis van Solanum demissum voor de veredeling gericht op verhoging van de knolophrengst. (On the possible significance of Solanum demissum in improving the yield of the cultivated potato). Euphytica 1: 133-139.

Study of S. demissum - S. tuberosum hybrids shows that S. demissum contributes not only genes for blight resistance but probably also factors for tuber yield.

Siebeneick, H. 1948. The German and foreign potato varieties. Schriftenreihe Kartoffelwirtschaft 1948 No. 2-3. Pp. 76. Tabular description of potato varieties including origin, botanical characteristics, cooking quality and disease resistance.

Wiersema, H. T. 1950. Groeistoffen en plantenveredeling naar aanleiding van een onderzoek bij aardappels. (Growth substances and plant breeding with reference to an experiment with potatoes). Notulen Studiekkring voor plantenveredeling (Transactions, Netherlands Study Centre of Plant Breeding). Wageningen. p. 338-341. (Mimeographed).

For fruit setting in the variety Rintje (which is normally both pollen and ovule sterile), spraying with 0.2 % solution of Regulex 2-4 D, 2 to 3 days after crossing, is recommended.

II CYTOGENETICS AND SPECIES CROSSABILITY

Bains, G. S. and Howard, H. W. 1950. Haploid plants of Solanum demissum. Nature 166: 795.

Dodds, K. S. 1950. Polyhaploids of Solanum demissum. Nature 166: 795.

Howard, H. W. and Swaminathan, M. S. 1952. Species differentiation in the section Tuberarium of Solanum with particular reference to the use of interspecific hybridization in breeding. Euphytica 1: 20-28.

The existence of small scale structural differences among the chromosome complements of Solanum species is considered probable. The presence or absence of such differences will have an important bearing on the possibility for transferring useful characters from wild to cultivated species. Breeding with S. demissum by first producing tetraploid hybrids from it by crossing it to a diploid species and then crossing the tetraploid plants to S. tuberosum is recommended, since this method has on theoretical ground an advantage over the pentaploid backcross method in minimizing the number of aneuploid progeny.

Koopmans, A. 1951. Cytogenetic studies on Solanum tuberosum L and some of its relatives. *Genetica* 25: 193-337.

Results of cytogenetic studies in diploid, triploid, tetraploid and pentaploid species hybrids and in artificially produced polyploids are given. 275 papers are cited.

Lamm, R. 1945. Cytogenetic studies in Solanum, Sect. Tuberarium. *Hereditas* 31: 1-128.

Prakken, R. and Swaminathan, M. S. 1952. Cytological behaviour of some interspecific hybrids in the genus Solanum, Sect. Tuberarium. *Genetica* 26: 77-101.

Instances of the function of unreduced gametes in diploid ($2n = 24$) Solanum species are mentioned and it is pointed out that there is at present no substantial evidence in favour of the hypothesis put forward by some authors that the basic chromosome number in the genus is 6 and not 12.

Stelzner, G. 1949. Über die Erzeugung von Bastarden von Solanum polyadenium (Greenm) mit Kulturkartoffelsorten und ihre Resistenzmarkmale. (On the production of hybrids of S. polyadenium (Greenm) with cultivated potato varieties and their resistance characteristics). *Züchter* 19: 331-333.

S. tuberosum can be crossed with S. polyadenium by using S. tuberosum varieties grafted on tomato as the female parent and tetraploid S. polyadenium as the pollen parent.

III RESISTANCE TO DISEASES AND PESTS

General

Müller, K. O. and Black W. 1952. Potato breeding for resistance to blight and virus diseases during the last hundred years. *Z. Pflanzenzucht.* 31: 305-318.

Wart

Lunden, A. P. 1950. Undersøkelser over reaksjon mot kreft (Synchytrium endobioticum) hos potet. (Investigations on the reaction to wart in the potato.) Norges Landbrukshøgskoles Akervekstforsøk Melding No. 137. Pp. 48.

Three genes control resistance to wart--a dominant X and two complementary dominants Y and Z, both of which are independent of X. Plants simplex for X are resistant and so are plants simplex for both Y and Z. Immunity to wart was not present in any variety in a homozygous condition, but certain varieties, such as Kerrs Pink and Doon Star (which are duplex for X) gave progenies containing a very high proportion of immunes. The segregation data could be interpreted on the basis of random chromosome segregation in an autotetraploid.

Fusarium

Mooi, J. C. 1950. Het Fusarium-rot of Droogrot bij aardappeln.
(Fusarium or dry rot of potatoes).
Landbouk Tijdschr. Wageningen 62: 712-724.

Voran, Zeeburger and Arenthamer are very resistant while Bintje, Record and Eigenheimer are very susceptible. Considerable resistance is also found in S. demissum hybrids.

Black Leg

Stapp, C. 1950. Weitere Untersuchungen uber die Resistenz der deutschen Kartoffelsorten gegen Bacterium phytophthorum Appel. (Further investigations on the resistance of the German varieties of potatoes to B. phytophthorum Appel).
Phytopath. Zeitschr. 16: 202-214.

Among 65 German commercial varieties tested, Carnea, Flora, Johanna, Prissa, Robusta and Starkeragis were highly resistant.

Scab

Bruyn, H. L. G. de 1947. Wisselbouw van aardappelrassen als bestrijdingsmiddel tegen schurft. (Rotation of potato varieties to prevent scab.)
Tijdschr. Plziekt. 53: 139-143.

Passage of the scab organism through a susceptible potato variety increases its virulence. Cultivation of varieties resistant to many races of scab should therefore reduce both the virulence and number of the scab organisms present in the soil.

McKay, R. 1949. The susceptibility of some potato varieties to common scab (Actinomyces Scabies Thaxt. Gussow) in different soils.
Sci. Proc. Roy. Dublin Soc. 25: 65-81.

Sixty-five varieties tested in Eire during the years 1941-1946 were all susceptible to scab. Earlies and second earlies were less affected than late varieties. There was no correlation between scab resistance and russet skin.

Late Blight

Black, W. 1952. Inheritance of resistance to blight. (Phytophthora infestans) in potatoes. Inter-relationships of genes and strains.
Proc. Roy. Soc. Edinburgh B 64: 312-352.

Bruyn, H. L. G. de 1951. Pathogenic differentiation in Phytophthora infestans (Mont.) de Bary.
Phytopath. Zeitschr. 18: 339-359.

Problems arising from the extreme plasticity of the late blight fungus are considered.

Castronovo, A. 1950. Fuentes de resistencia a "Phytophthora infestans."
(Sources of resistance to P. infestans).
Rev. Invest. Agric. Buenos Aires 4: 245-275.

Tabular data are given showing the reaction of a large collection of potato varieties, domestic and wild, to artificial infection with two Argentine cultures of P. infestans.

Cooper, J. P. and Howard, H. W. 1952. The chromosome numbers of seedlings from the cross Solanum demissum x tuberosum backcrossed by S. tuberosum.
J. Genetics 50: 511-521.

Hanni, H. 1949. Beitrag zur Biologie and Bekämpfung der Kraut- und Knollenfaule der Kartoffel, verursacht durch Phytophthora infestans (Mont.) de By. (On the biology and control of potato late blight, caused by P. infestans (Mont.) de By. Phytopath. Zeitschr. 15: 209-332.

This study deals extensively with methods and results obtained by the author in Switzerland and by other workers.

Hawkes, J. G. 1950. Algunas observaciones sobre la papa del Ecuador. (Some observations on the potatoes of Ecuador).
Flora, Quito 7: Nos. 17-20: 93-96.

Mention is made of a wild Colombian species, Solanum Andreanum, which is immune to Phytophthora infestans, of various wild potato species found in Ecuador and the potato diseases occurring there.

Kammermann, N. 1950. Undersokningar rörande potatisbladmoglet, Phytophthora infestans (Mont.) de Bary. I. Metodologisk undersokning angående provningen av potatisblastens resistens mot bladmoglet. (Investigations concerning leaf blight P. infestans, I. A methodological investigation with reference to the testing of resistance of the potato haulm to blight).
Medd. Vaxtskyddanst., Stockh. 57: Pp. 41.

_____. 1951. II. Sambandet mellan potatisbladsaftens peroxidasaktivitet och Phytophthoraresistensen. (II. The relation between the peroxidase activity of the sap of the potato haulm and resistance to Phytophthora).
Medd. Vaxtskyddanst. Stockh. 58: Pp. 32.

An attempt was made to replace the biological method of blight testing by a simple chemical test based on the peroxidase content of the leaf sap. While this method gave reliable information about the degree of resistance in S. tuberosum varieties, no relation was found between the peroxidase content and immunity in hybrids from crosses between S. tuberosum and other Solanum species.

Lihnell, D. 1951. Provnig av potatisblastens resistens mot bladmogel. (Testing the resistance of potato haulms to leaf blight). Vaxtskyddsnotiser No. 2-3: 29-33.

Methods of blight testing adopted at the Swedish Seed Association, Svalof, are described.

Mastenbroek, C. 1952a. Over de differentiatie van Phytophthora infestans (Mont.) de Bary en de vererving van de resistentie van Solanum demissum lindl. (Investigations into the differentiation of Phytophthora infestans (Mont.) de Bary and the inheritance of the immunity of Solanum demissum lindl.) Thesis, Landbouwhogeschool, Wageningen. Pp. 121.

Mastenbroek, C. 1952b. Investigations into the inheritance of the immunity from Phytophthora infestans de B. of Solanum demissum lindl. Euphytica 1: 187-198.

Nine races of P. infestans have been isolated in Holland and from a study of the reaction of S. demissum x S. tuberosum hybrids to these races, three genes for immunity have been postulated. The correlation between the strains used by the author with those used by Black in Scotland and Peterson and Mills in U.S.A.¹⁸ given below:

Author	Races of <u>P. infestans</u>										
Black	A	B ₁	D	-	C	B ₂	-	-	E	F	-
Peterson and Mills	A	D	B	C	BC	BD	BCD	-	-	-	CD
Mastenbroek	N ₁	N ₂	N ₄	N ₅	N ₆	N ₇	N ₈	N ₉	-	-	-

Müller, K. O. 1950. Hypersensitivity and tumour development in potato tubers in response to infections with Phytophthora infestans. Nature, Lond., 166: 231-232.

When inoculated with parabiontic strains of the late blight fungus, (i.e., those strains which kill the cells quickly thereby arresting the further growth of the hyphae) tumours were developed in F₂ plants of a cross between a "W" variety and a common variety. It hence appears that in addition to the gene R which controls the degree of sensitivity of the affected tissues to the invading fungus, there is another gene which enables the cells to grow and divide in response to the influence of substances released by the dying tissues.

Müller, K. O. 1950. Affinity and reactivity of angiosperms to Phytophthora infestans. Nature, Lond., 166: 392-395.

Affinity and reactivity to P. infestans are characters which may be possessed by many members of Angiospermae regardless of the phylogenetic position of the plants in question.

- " Müller, K. O. 1951. Über die Herkunft der W-sorten, ihre Entwicklungsgeschichte und ihre bisherige Nutzung in der praktischen Kartoffelzuchtung. (On the origin of the W varieties, the history of their development and their use in practical potato breeding).
Z. Pflanzenzucht. 29: 366-387.
- " Müller, K. O. and Behr, L. 1949. Mechanism of Phytophthora resistance of potatoes.
Nature, Lond., 163: 498-499.

The blight fungus is capable of invading the cells of both susceptible and resistant types, but the resistant varieties have cells which are quickly killed by the fungus. It is this hypersensitivity of the cells which produces the resistance to blight. It was also found that the cells of susceptible types become hypersensitive to the fungus at low temperatures. This suggested that the R genes in the W-varieties are not responsible directly for the resistance, but only act in speeding up the rate at which the protoplasm of the potato cells is killed by the fungus and thus made unusable as a host.

- " Müller, K. O. and Munro, J. 1951. The reaction of virus-infected potato plants to Phytophthora infestans.
Ann. Appl. Biol. 38: 765-773.

The growth of P. infestans was retarded on leaves of seven varieties previously inoculated with strains of virus X or virus Y as compared with healthy leaves.

- Rudorf, W. and Schaper, P. 1951. Grundlagen und Ergebnisse der Zuchtung krautfauleresistente Kartoffelsorten. (Principles and results of breeding Phytophthora resistant potato varieties).
Z. Pflanzenzucht. 38: 29-88.

Breeding with complex hybrids (i.e. hybrids involving two or more wild species) seems promising, since it has been found that the resistance genes of several wild species tend to be concentrated in them, with the simultaneous suppression of the undesirable genes of such species.

- Schaper, P. 1949. Die Krautfäule - Anfalligkeit einiger deutscher Kartoffelsorten 1947/48. (The susceptibility to blight of some German potato varieties 1947/48).
Züchter 19: 265-271.

In a test of 64 S. tuberosum varieties and 10 hybrid lines from the cross S. tuberosum or S. andigenum x S. demissum, it was found that while all the S. tuberosum varieties were either susceptible or weakly resistant, the hybrid varieties, excepting Robusta, were highly resistant. There was no clear relationship between the resistance of the leaf and of the tuber.

Schaper, P. 1951. Die Bedeutung der Inkubationszeit für die Züchtung krautfaulerresistenter Kartoffelsorten. (The significance of the incubation time for the breeding of blight resistant varieties of potato).
Z. Pflanzenzucht. 30: 292-299.

After infection with the blight fungus, the normal period for attaining profuse fructification in susceptible types of potato is 3-6 days. This period is 1-2 days longer in the varieties Allerfrüheste Gelbe, Voran and Ackersegen. Selection for delayed incubation and the production of only a small number of sporangia may be useful in breeding for blight resistance.

Virus diseases

Anon. 1951. Proceedings of the conference on potato virus diseases, Wageningen - Lisse. (13-17 August, 1951). Pp. 89.

Contains 21 papers on various aspects of potato virus diseases.

Bald, J. G. and Hutton, E. M. 1950. Some effects of leaf roll virus on the development of the potato plant.
Austr. Jour. Agric. Res. 1: 3-17.

Bercks, R. 1951. Weitere Untersuchungen zur Frage der Altersresistenz der Kartoffelpflanzen gegen das X-virus. (Further investigations on the question of resistance to virus X due to age of the potato plant).
Phytopath. Zeitschr. 18: 249-269.

The role of nutrition in regard to incidence of infection with virus X and the probable cause of resistance due to age are discussed.

Cockerham, G. 1951. Breeding for resistance to potato viruses.
Proc. Conf. virus diseases, Wageningen-Lisse. (13-17 August, 1951).
Pp. 37-39.

Hutton, E. M. 1946. The relationship between necroses and resistance to virus Y in the potato. 3. Interrelation with virus C.
Jour. Council. Sci. Ind. Res. Austr. 19: 273.

_____. 1948. Some factors affecting localized and systemic necrotic reactions to virus Y in the potato.
Austr. Jour. Sci. Res. B. 1: 416-438.

_____. 1951. Possible genotypes conditioning virus resistance in the potato and tomato.
Jour. Aust. Inst. Agri. Sci. 17: 132-138.

_____ and Peak, A. R. 1951. Inoculation techniques for studying the genetics of virus resistance in plants.
Jour. Aust. Inst. Agric. Sci. 17: 193-198.

_____ 1952. Definition of potato virus Y strains by some Solanaceous species.
Aust. Jour. Agric. Res. 3: 1-6.

Kohler, E., Bode, O. and Hauschild, J. 1949. Vergleichende Untersuchungen über die Blattroll - Resistenz von 5 mittelspaten Kartoffelsorten. (Comparative investigations of the leaf roll resistance of five mid-late potato varieties). NachrBlatt. biol. Zent Anst. Braunschweig 1: 81-82.

The variety Aquila showed a very high degree of resistance to infection (14% compared with 85% in Ostbote) and a very low degree of tolerance.

Kohler, E. and Ross, H. 1951. Das Verhalten verschiedener Kartoffelsorten gegenüber verschiedenen Stämmen des X-virus im Pfropfversuch, 1. Mitteilung. (The reaction of potato varieties to different strains of virus X in grafting experiments.) Züchter 21: 179-185.

The reaction of 53 German varieties to nine strains of virus X are given.

Lunden, A. P. 1951. Virussykdommer på potet. Virkningen av virus X (Solanum virus 1) på avkastningsevne, torrstoffinnhold, m. m og bekjempelsen av dette virus gjennom oppformering av virus frie stammer og gjennom foredlingsarbeidet. (Virus diseases in the potato. The effect of virus X on yield, dry matter content, etc., and the control of this virus by producing new virus-free strains and by breeding). Forskning Forsok Landbruk., Oslo, 2: 140-156.

During the years 1948-1950, the average loss in yield of tubers due to virus infection was 11% in the Norwegian variety As. The ascorbic acid content was also decreased.

McKay, R. and Clinch, P. E. M. 1951. Observations on the inheritance of field resistance to leaf roll of potatoes. (Shamrock x Skerry Champion). Sci. Proc. Roy. Dublin Soc. 25: 225-233.

The varieties Shamrock and Skerry Champion are highly resistant to leaf roll infection in the field but are not immune. Three out of 22 seedling units from the cross between these two varieties showed field resistance to leaf roll, completely escaping infection.

Ross, H. 1951. Studies on mosaic resistance in the potato. Proc. Conf. Potato virus diseases, Wageningen - Lisse. (13-17 August, 1951). Pp. 40-47.

It seems probable that the gene Nx (which confers field immunity to virus X) may have originated from the variety Patersons Victoria. The immunity to virus X found in some S. acaule varieties is dominant in crosses with susceptible S. tuberosum varieties. Resistance to viruses Y and A found in commercial varieties and Solanum species are mentioned.

Ross, H. and Baerecke, M. L. 1951. Über die Bedeutung der argentinischen *Solanum* - Arten simplicifolium, vernei, berthaultii, acaule und einiger Formen von S. andigenum für die Züchtung Krankheitsresistenter Kartoffeln. (On the significance of the Argentine *Solanum* species simplicifolium, vernei, berthaultii, acaule and some forms of S. andigenum for the breeding of disease resistant potatoes). Z. Pflanzenzucht. 30: 280-291.

Some seedlings of S. simplicifolium and S. vernei could not be infected with viruses Y^N or Y^O either artificially with sap or in the field by contact or by aphids. None of the seedlings of the cross S. acaule "Bukasov" x S. acaule "von Rosenstiel" could be infected by rubbing with viruses X^B or X^B.

Stelzner, G. 1950. Virusresistenz der Wildkartoffeln. (Virus resistance of wild potatoes). Z. Pflanzenzucht. 29: 135-158.

S. antipoviczii and S. ajuscoense show immunity to viruses Y and A and seem to be the most promising material for breeding. Some clones of S. acaule are immune to virus X.

Nematode

Ellenby, C. 1948. Resistance to the potato-root eelworm. Nature, Lond., 162: 704.

From tests carried out during 1945-1947, it appears that S. Ballsii while not immune, is extremely resistant.

_____. 1952. Resistance to the potato root eelworm, Heterodera rostochiensis Wollenweber. Nature, Lond., 170: 1016.

The following four lines of S. andigenum belonging to the Commonwealth Potato Collection, Cambridge, were found to be resistant -- C.P.C. 1595, 1673, 1685 and 1692.

Oostenbrink, M. 1950. Het aardappelaaltje (Heterodera rostochiensis Wollenweber), een gevaarlijke parasiet voor de eenzijdige aardappel - cultuur. The potato nematode (Heterodera rostochiensis Wollenweber), a dangerous parasite for intensive potato culture. Netherlands Plantenziektenkundige Dienst. Verslagen en Meded. 115. Pp. 230.

The life history and rate of multiplication of the golden nematode are considered in great detail. All the varieties tested proved to be susceptible.

Toxopeus, H. J. and Huijsman, C. A. 1952. Genotypical background of resistance to Heterodera rostochiensis in Solanum tuberosum var - andigenum. Nature, Lond., 170: 1016.

Among selfed seedlings of *S. andigenum* (C.P.C. 1673, 1685 and 1692) tested for resistance to the root eelworm, 25 were found to be resistant and 7 susceptible. The results showed that resistance is inherited.

Colorado beetle

Torka, M. 1949. Die resistenz von *Solanum chacoense* Bitt. gegen *Leptimotarsa decemlineata* Say und ihre Bedeutung fur die Kartoffelzuchtung. (The resistance of *S. chacoense* to *Leptimotarsa decemlineata* Say and its significance for potato breeding).
Z. Pflanzenzucht. 28: 63-78.

In hybrids of *S. chacoense* with *S. tuberosum*, resistance was found to be polygenically inherited.

Toxopeus, H. J. 1949. The significance of resistance in tuber-bearing wild *Solanum* species for the breeding of a commercial potato resistant to the Colorado beetle.
Progress Report for the meeting of the C. E. Z. A. at Wageningen. 12th September, 1949. Pp. 7 (Mimeographed).

S. demissum appears to be a promising source of resistance in breeding work.