林傳光先生科學論文集

俞大紱謹題

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前言

著名植物病理學家、北京農業大學一級教授林傳光於一九八〇年三月卅一日不幸逝世，終年七十歲。

林傳光早年求學美國，獲博士學位。一九四一年回中國後，長期從事教育與植物病理的研究工作，在眞菌生理、水稻病害、生理病害、植物抗菌素、馬鈴薯晚疫病和退化等許多方面都有深入的研究。成績卓著，並培養了大批教學和科研技術人材。

其主要研究成果有：

一、具體植物病害的研究

(1)馬鈴薯退化——研究出溫度對病毒侵染之後寄主的病性變化的規律作爲制定種薯生產制度的指針。

(2)馬鈴薯晚疫病

1) 根據以中心病株開始的病害流行規律，奠定了簡易預測預報方法的基礎。

2) 根據中心病株形成過程和數量，提出以降低病害率及田間抗病品種爲重點的防治方法。

二、眞菌生理的研究

(1)孢子萌發生理

1) 稻粒黑穗病菌厚垣孢子

發現①短光波是水稻粒黑穗病菌厚垣孢子萌發的有效光綫。

②從區別感光作用和感溫作用獲得了光綫起排除孢子萌發抑制物質作用的依據。

2) 分生孢子——發現經過洗滌後，有些孢子萌發條件中要求補給能源，甚至需要補充一部份礦質營養，並大大提高了對銅素的敏感性，從而證明陽離子對銅素按價數起程度不同的解毒作用。

(2)卵菌生理——以腐霉和疫霉爲研究對象，發現有機酸利於氨基酸的合成但有增加細胞透性的不利作用，這一矛盾可以通過提高鈣素濃度來解決。

本書收集的科學論文共三十四篇，按其發表年月順序排列之。

此文集在整理印刷中承 Expedi 印刷廠負責人陳憲中先生多方協助致能順利印出特誌深誠的謝意。

序言

林傳光教授（一九一〇～一九八〇），原籍福州。一九三三年畢業於南京金陵大學農學院，學績優異，遂留校任助教。一九三七年赴美國康乃爾大學農學院，專修植物病理學與眞菌學。日夜攻讀，孜孜不倦，研究成果，冠於全院。一九四〇年得博士學位後返國，任金陵大學植物病系教授。

四年後（一九四四年）林教授應農林部之邀，參加專家考察團，在美國各地考察農業及植病情況，歷時一年之久。返國後卽留農林部任顧問。旋抗戰勝利，迅速復員，俞大紱老師應命出長北京大學農學院，林傳光奉院長之召，於一九四六年北上，任北京大學植物病理系主任。

我三生有幸，得與林傳光結不解之緣。我雖爲後學，却與他在金陵同學，又同年去康乃爾，同年在康校畢業。同年奉俞院長之命去北京大學農藝系任教。我們又住在一個宿舍區內，周末時常同桌作橋牌之戲，大有形影不離的樣子。但他與我亦有不同之處，他以讀書研究爲主，以橋牌爲消遣，我以橋牌爲主，以讀書爲消遣。

一九四九年中國大陸上展開了「米邱林路線」運動，提倡蘇聯農藝學家李森科辯證唯物的遺傳學，打倒唯心論形而上學反動的近代遺傳科學。我不幸是學遺傳學的，首當其衝。受批判後已無立足之地，遂於一九五〇年離開了北京大學農學院，所以關於林傳光一九五〇年以後的事，我就不大清楚了。

近年來，大陸的老友時常來美國進修或考察，我當然向他們探詢其他老友的消息。我向他們乞求着說：「君自故鄉來，應知故鄉事，務請告知一二，以慰遠懷。」這樣，傳光近三十年來的經歷及工作，我得略悉梗概。他的遭遇詳情，不便在此敍述。中國的科學人才，寥寥無幾，竟未能得到妥善的培植和利用，反遭百般折磨摧殘，令人苦思莫解。

一九五八年傳光得了氣喘及胃出血等症。這或就是他以後的巴金森病症的先聲。病況逐年加重，曾多次送往醫院急救。一九六〇～六五年間，他的健康每下愈況。一九六六以後，病情更是一蹶不振。

一九八〇年三月上旬，由親戚邀約，林傳光偕妻女來美國南部就醫，我喜出望外，本擬待他稍稍休息後再南下探視，並痛吐衷腸。無奈天有不測風雲，他突然於三月卅一日與世長辭了。我竟未及一晤，這是我的終身憾事。

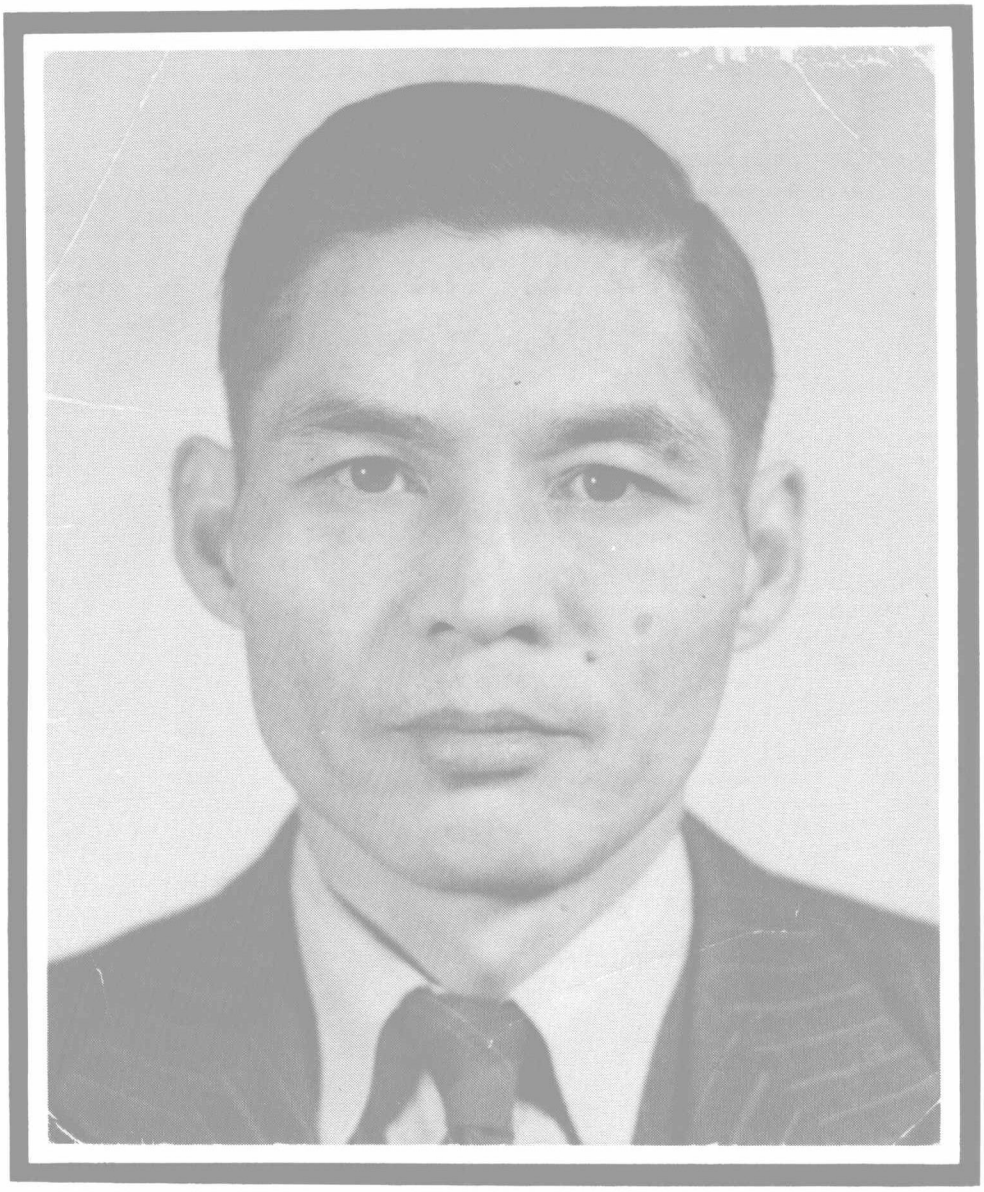
我一生所認識的朋友中，很少有像傳光那樣肯吃苦用功的。無論環境如何惡劣，他的科學興趣始終不變。無論設備如何簡陋，他的研究工作延續不斷。凡認識傳光的人，必會與我同意；他是一位沉默寡言的人，不苟言、不苟笑，思考週密，治學嚴謹。他從來不說大話，不說空話，不說謊話，不說廢話。

傳光的研究成果極爲豐碩。這本論文集所選的三十四篇僅代表他的工作的一部份，而非全貌。雖重病中，他仍堅持寫作，甚或口述，由嫂夫人筆錄，未能完稿。今賴親友襄助，得將此三十四篇論文付印，以資紀念這位艱苦卓絕的大植物病理學家。

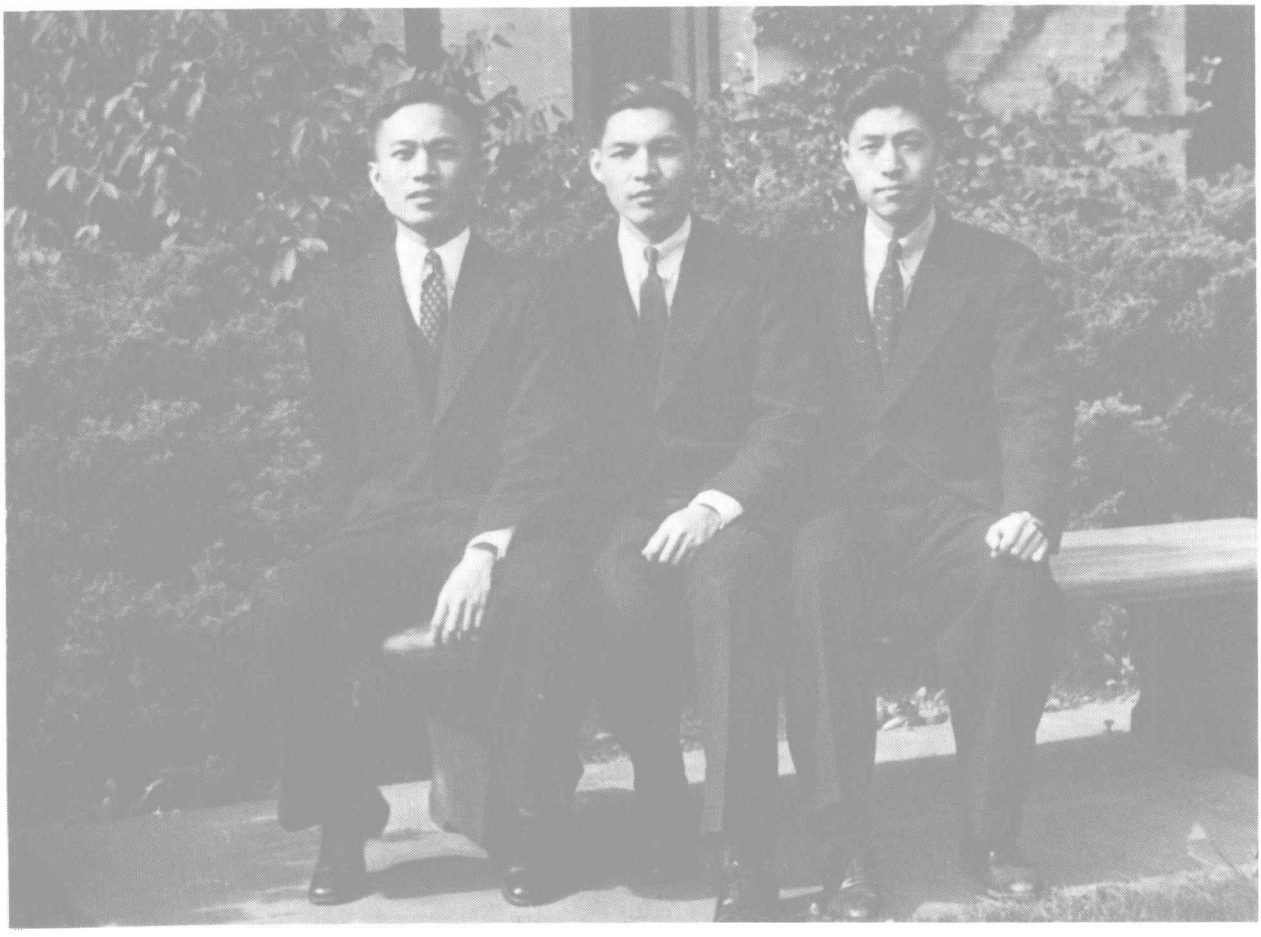
後學弟

李景均謹識

一九八一年五月五日於皮氏堡大學

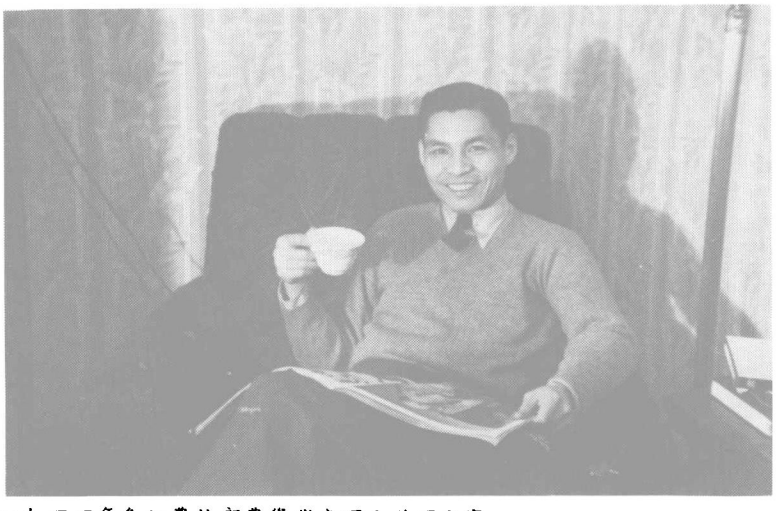


林傳光先生遺像



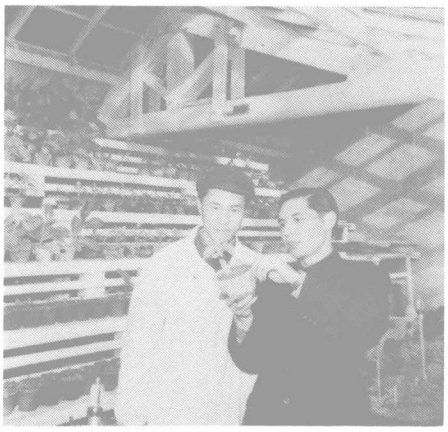
一九三九年在美國康乃爾大學農學院研究院攻讀（與沈隽、郭則虬二先生合影）

林傳光先生紀念圖片集

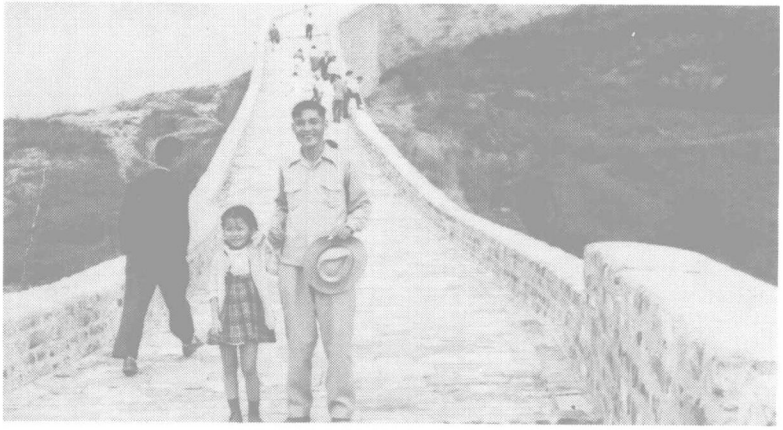


一九四四年參加農林部農學代表團去美國考察

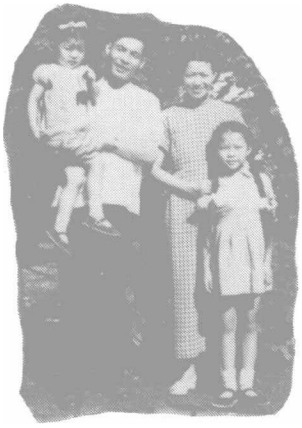
一九四七年在北京大學農學院



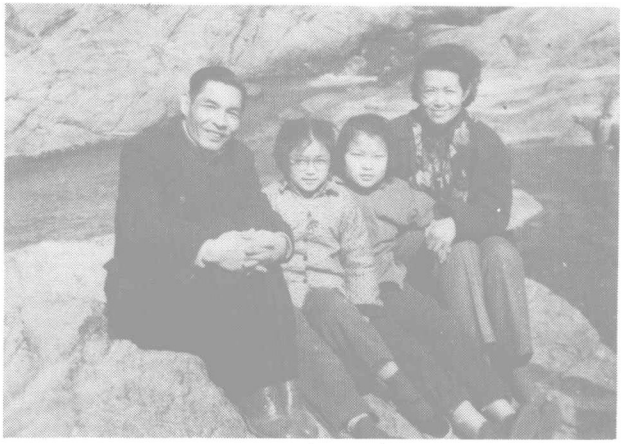
一九五四年與田波在溫室做病毒試驗



一九五六年遊長城



一九五五年在北京農業大學



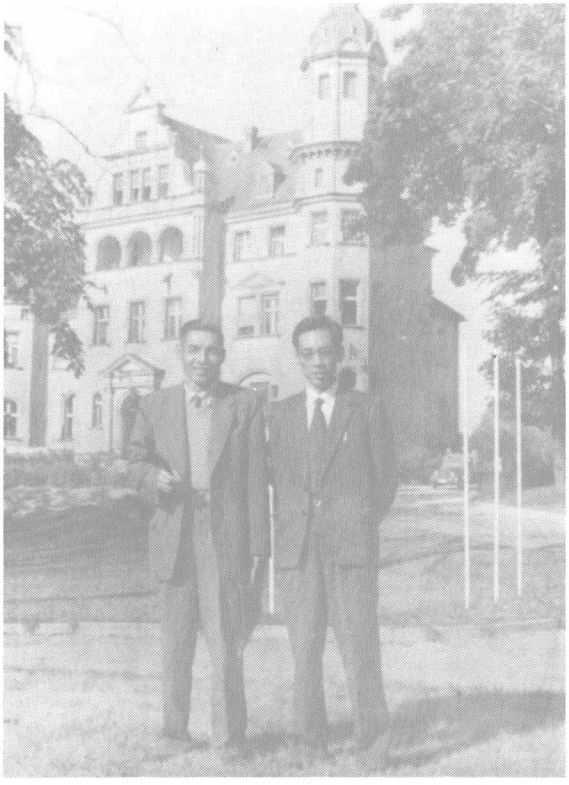
一九六二年冬在廣州從化療養院

一九五八年去蘇聯參加學術討論會

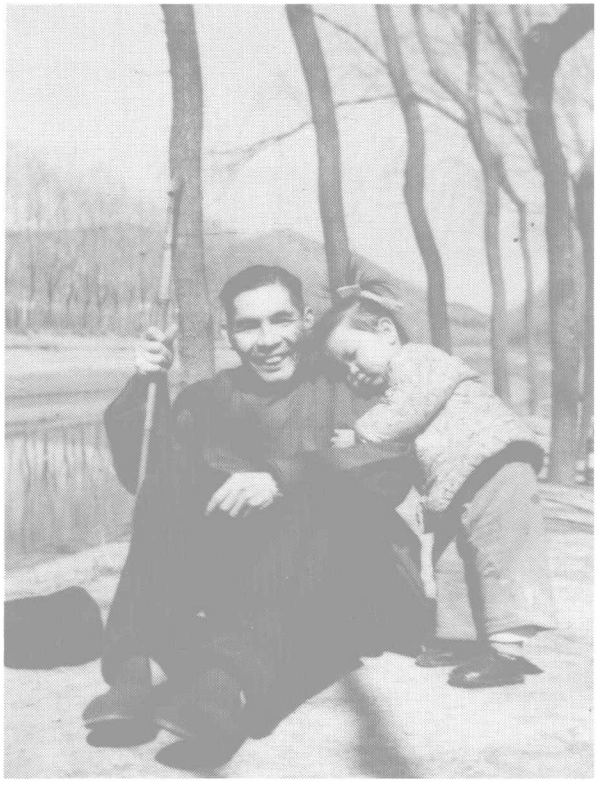
一九七六年春攝于北京頤和園

一九七二年冬在北京頤和園

一九六三年冬在海南島調查與研究橡膠病害

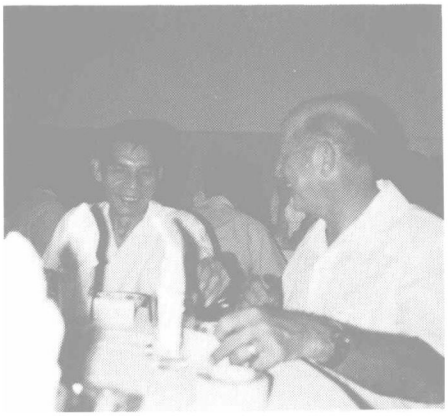


一九六四年秋與劉儀去東德作學術報告



一九七七年春在北京

一九七八年春在中醫研究院中藥研究所與劉文臣，戴如琴進行中藥研究



一九七八年夏與康乃爾老同學尼德豪舍博士（DR. NIEDERHAUSER）攝于北京

一九七九年夏在北京家中養病（海外親戚來京探視）

懷念我的爸爸

爸爸和我可說是不辭而別，待他雙目慢慢緊閉，四五年來越來越僵硬的四肢放鬆下來，面部的可怕表情消失時，我仍在給他作人工呼吸。但我終於明白，這是最後一次了。他的手在我的手中慢慢冷下去，我緊緊地握住這雙手，直到救護車來。

我們沒有預備他這麼快地離去。雖然爸爸已病入膏肓是很明顯的事，但我們都不肯理智地承認這個現實。在我們有限的行李中大部份是爸爸的衣物。從書稿到補品中藥，凡是想得到的都帶上了。就是他人已過去一兩個月後，我們還源源不斷地收到臨行前我們自己寄出的爸爸的書和卡片盒。面對這一切，我們母女悲慟欲絕！爸爸自己也沒有打算這麼快就草草結束一生，他還有工作計劃，還有一部書才寫了四分之一，還有許多話要講……兩三年來他忍受了非人的病痛的折磨，長期服藥後越來越强烈的反應，使我不忍目睹。勸他減藥，他却勉强地說出「堅持」兩個字！他多麼想活，想繼續他一生所酷愛的事業啊！

我愛我的爸爸，除了他是生我養我教我成人的人以外，我敬重他的爲人和他的學問、他誠懇待人的處世原則、他對科學老老實實一絲不苟的精神和他嚴謹的治學態度。不僅我們作女兒的，在學生中爸爸也因此受到尊敬和愛戴，成爲大家學習的榜樣。

爸爸是個典型的沉默寡言的人，喜歡深思，分析問題精僻，一針見血，耐人尋味，生活小事極爲隨和；但若遇到原則問題則又驚人地固執。他從不吹噓，從不誇大。我們都記得爸爸不止一次說過，他最欣賞孔子的名言「知之爲知之，不知爲不知，是知也」。他曾把這句格言引在他的博士論文前頁。他對那種自吹自擂、嘩衆取寵的人嗤之以鼻；對那種趨炎附勢，依靠鑽營而獵取名利的人深惡痛絕。他要我們出污泥而不染，在任何環境中不可染上吹吹拍拍、華而不實的惡習。我不記得和爸爸聊過「人生哲學」，但他的一言一行却產生了潛移默化的巨大影響，無形中構成我和妹妹相同的作人準則。任何時候，我們都會想到不能辜負爸爸的希望，要配得上作他的女兒。

爸爸不在乎名利，却十分重視他的勞動成果的價值；但他却受到不祇一次不公平不客觀的對待。特別是當他在病中，那殘酷無情的打擊着實不輕。他是一個把痛苦深埋心底的人，但我却能看出那損傷的程度，大過任何別的刺激！他渴望全心全意專心一致地爲科學奮鬥，渴望不受任何干擾地工作，但幾十年來終未能如願！

爸爸在病床上工作的情景給我留下難以磨滅的記憶。那時他的生活已經完全不能自理，但白天總要堅持工作幾個小時。有時是替學生校對譯稿，他看原文，我讀譯稿。從每句話每個字的譯意是否準確、句子是否通順到每個標點符號是否恰當，他都要反覆訂正，直到滿意爲止。這種精益求精的嚴格標準令我驚訝，要知道那時他常常連說話都很困難啊！這是我得到的唯一機會在他身邊看他工作。爸爸不認爲寫教材、校譯稿是浪費精力的事情，就是當他自己也已發現時間對他來說更加有限、更加寶貴時仍然是這樣。他急於培養可以繼續事業的人材，特別是在他病重之後，這種願望更加强烈。

爸爸珍視人與人之間的眞摯情誼，他尊敬老師愛護學生，對他們的感情不亞於對待父母

子女。若能與他們一道爲了共同的事業勤奮努力地工作更令他神往！在他的病床邊，年邁的老師和遠道的學生都來探望。學生們像對父親像對兄長無所不談，從社會到單位，從工作到家庭。每當這時爸爸總是精神振奮，仿佛病也輕了許多。這些親切的深情使他倍感溫暖。

在爸爸病重時，他曾說過，他能得到這樣一個家庭使他感到驕傲和滿足。每當想起他說的這句話，我心裡似乎稍稍得到一點安慰。除此之外，爸爸給我留下更多的，却是令人心酸的回憶和終身的遺憾。對我來說，爸爸雖死猶生。雖然我不相信有天國也不信人死後還存靈魂，但我却時刻感覺到爸爸還像以前一樣，與我們同分憂苦，共享歡樂！

林　怡

目錄

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STUDIES ON HELMINTHOSPORIOSE OF RICE

II. INFECTION AND CONTROL

By C. K. Lin*

INTRODUCTION

Helminthosporiose is one of the most important diseases of rice in China. Surveys made by C. T. Wei and the writer since 1931 show that it is generally prevalent both in the nursery and in the field in Kiangsu and Chekiang Provinces. According to Tsui and his co-workers (13), loss of paddy rice due to helminthosporiose in 1934 was 2.7 percent of the total crop in Hangchow, Chekiang.

Under the rice disease investigation projects supported by the China Foundation, studies of this disease were initiated in 1929. This paper is a report of the progress to date, and includes an investigation of the damage caused by the disease, overwintering of the causal organism, sources of primary infection, relation of stage of maturity of grains to infection, effectiveness of seed treatments, and varietal susceptibility of rice to the disease.

DAMAGE CAUSED BY THE DISEASE

Types of Injury.

Seedling. Seedlings may be found to be infected immediately after their emergence. In general the coleoptile becomes spotted first. In serious cases, an irregular brown rotted area can be seen on the coleoptile. Young leaves emerging from these coleoptiles, often bear typical spots. The root may also produce small, dark colored spots which are often particularly noticeable at the tip (Fig. 1 and 2) from which the causal fungus has been repeatedly isolated. It is not uncommon to find that the portion between the first whorl of roots and the lower end of the culm has become dark brown in color as a result of the infection (Fig. 5). In a humid atmosphere, such as in a moist chamber, woolly mycelia (Fig. 4) of the fungus often grow out from the soil near the seedling. These aerial mycelia spread from one plant to another, causing serious injury to the young leaves. Leaves so attacked first become splotched and rotting soon follows (Fig. 3).

Mature plants. Besides the characteristic spotting of the leaves, all other aerial parts are subject to the attack of the fungus.

*The writer wishes to acknowledge gratefully his indebtedness to Dr. T. F. Yu under whose direction this work was conducted, for his advice and encouragement throughout the course of the investigation and the preparation of the manuscript. Thanks are due to Mr. C. T. Wei who initiated several of the experiments, and also to Mr. W. F. Chiu for his kind help.

Sheath infection is more conspicuous on the inner than on the outer surface. Under ordinary conditions the spots on the outer surface vary from the size of a pinhead to an oblong spot measuring ½×2 mm., and are walnut brown in color. The lesions on the inner surface are usually three to four times larger than those appearing on the outer surface, with an amber brown center and ochraceous tawny (8) margins which are not well defined. Isolated spots found close together on the outer surface usually coalesce on the inner surface. In highly susceptible varieties under prolonged moist conditions, the sheath may be so seriously affected that very large lesions as shown in Fig. 7 may be found on both surfaces. Sometimes attractive seal brown (8) lesions appear near the ligule at the articulation between the sheath and the blade.

The disease on the stems is negligible. Only rarely do the portions enclosed by the diseased sheath become infected. The exposed portions on the panicle stalks sometimes produce a few tiny spots. However, stems wounded by needle pricks develop large carrot brown (8) areas two days after artificial inoculation.

Grains are especially liable to be attacked. The severity of the disease on grains, as will be shown later, depends chiefly upon the stage of maturity in which infection takes place. Slightly affected grains are spotted with minute splotches of different shades of brown, fading toward the margins. From one to twenty spots may be found on a single grain. Severely affected grains show a large blackened area on a portion or over the entire surface of the grains. In an advanced stage of infection, these lesions may become powdery in the center. In spite of serious infection, the kernels, though not so plump as healthy ones, usually develop into germinative seeds (Fig. 6).

DEGREE OF NATURAL INFECTION AND EFFECT

Although the disease is present throughout the rice growing season, field observations disclose that seedling and grain infections are the only two types of injury worthy of note.

On June 13, 1934, a survey was made to estimate the percentage of disease and its effect on the growth of seedlings in Nanking. About 300 seedlings were collected at random from seven seed beds, and were separated into three classes namely, healthy, slightly diseased and severely diseased, according to the number of spots on each. The number of seedlings falling into each class was counted and the length of every seedling, including top and root, was measured. Table 1 shows that half of the total number of seedlings examined were severely diseased and that the height of the diseased plants averaged 20.8 percent

less than the height of the healthy ones. The fact that slightly diseased seedlings did not show any significant difference in height when compared with healthy ones was probably due to the fact that most of them were newly attacked.

Table 1. Degree of Seedling Infection by *Helminthosporium Oryzae* Breda de Haan in Relation to Height of Plants

Plot	Total	No. of* healthy plants	No. of* slightly diseased plans	No. of* severely diseased plants	Percent of disease	Percent of severe disease	Average** height of healthy plants	Average** height of slightly diseased plants	Average** height of severely diseased plants	Difference in average height of	
										Slightly diseased plants	Severely diseased plants
										***	
1	130	55	54	21	57.69	16.15	29.65	31.02	26.10	+1.37	−3.55
2	319	17	73	229	94.67	71.79	22.94	21.63	18.96	−1.31	−3.98
3	171	25	39	107	85.37	62.57	27.16	28.05	21.01	+0.96	−6.15
4	197	9	60	128	95.43	64.97	31.11	31.67	23.27	+0.56	−7.84
5	347	79	118	150	77.23	43.23	26.51	23.81	17.32	−2.70	−9.19
6	307	10	97	200	96.74	65.15	31.00	29.61	23.61	−1.39	−7.39
7	199	52	95	52	73.87	26.13	29.85	30.00	26.63	+0.15	−3.22
Total	1670	247	536	887							
Average					83.00	50.00	28.32	27.97	22.41	−0.34	−5.90
Percentage										1.20	20.84

*The diseased plants with more than 5 small spots or 3 large spots are counted as severely diseased; otherwise slightly diseased.

**In centimeters.

***The plus sign indicates an increase and the minus sign a decrease in the height of the slightly or severely diseased seedlings as compared with the healthy ones.

In order to estimate the amount of loss due to grain infection, two commercial varieties of paddy rice, C2312 and Round White (圓稻白) were examined. The former, a late variety, was grown under natural field conditions at Hangchow in 1934, and the latter, a medium variety, was grown in Nanking in 1935. These were secured respectively from the Chekiang Provincial Agricultural Experiment Station and the Department of Agronomy, University of Nanking. From each variety, about two thousand grains were classified into healthy, slightly diseased and severely diseased (Fig. 7). Each hundred seeds from each variety were weighed separately. In addition two other varieties grown in pots and inoculated in the summer of 1935 were similarly studied as to the effect of the disease on the weight of the grains. The data are summarized in Table 2.