

Appendix

1. OUTLINE OF FOOD LEGUMES IN TROPICAL ASIA

Summarized from the papers presented to the Symbposium, by K. Oda

| (1)         | (2)  | (3)                    | (4)  | (5)  | (6)  | (7)                              | (8)                               | (9)                          | (10)  | (11)   | (12)  | (13)   | (14)  | (15)   | (16)  | (17)  |  |
|-------------|--|------------------------|--|--|--|----------------------------------|-----------------------------------|------------------------------|---|--|---|--|---|--|---|---|--|
| Country     | Reference  | Major legumes          | Acreage (1,000ha)                            | Production (1,000tons)                       | Average yield (t/ha)   | Maximum yield (t/ha)             | Export                            | Import                       | Planting period   | Maturity duration (days)                                     | Climatic, geographical, or soil conditions                      | Cropping system  | Major varieties   | Major diseases   | Major pests   | Fert (kg)   |  |
| China Rep.  | Cheng, C.P.  | Soybean                | 40.2('71)                                    | 61.0('71)                                    | 1.52('71)  |                                  |                                   | 549.5('71)<br>(1,000 tons)   | mid-Feb. ~<br>mid-Mar. }<br>June }<br>July }<br>mid-Sep. }<br>mid-Oct. }  | 85-95 (spring & fall crops)<br>95-105 (summer crops)         |   | Multiple cropping (with two rice crops)  | Sankuo, Palmetto, Shih-shih, Wakajima, NTU-KS 5, Chung Hsing 2, Tainung 3, Tainung 4, Kaohsiung 3   | Rust   |   | N:20-40,<br>K <sub>2</sub> O:30-7<br>(Compost)                    |  |
|             |  | Peanut                 | 86.3 ( # )                                   | 9.75 ( # )                                   | 1.13 ( # )   |                                  |                                   |                              |   | Virginia:160-180<br>Spanish:120-135<br>(spring)<br>110autumn | Sandy loam, loam, Sandy soil.<br>32-33°C(max.)<br>11-12°C(min.) | (1) Two crops a year on dryland field.<br>(2) Three crops within 1.5 years.<br>(3) In 3-year-rotation paddy field.                           | Tainan 7,<br>Tainan 3,<br>Tainan 4,<br>Tainan selection 9,<br>Penghu 1.   | Leaf spot  |   | N:10-20,<br>K <sub>2</sub> O:40-5<br>(Compost)                    |  |
| India       | Jain, H.K.   | Chick pea              | (calcu. from table 1, 2)<br>9,029<br>(69-70) | (calcu. from table 1, 2)<br>5,962<br>(69-70) | (5)/(4)<br>0.66  |                                  |                                   |                              |   | (calcu. from table 5)<br>115-125(av.120)                     |   | Multiple cropping (with short duration varieties)<br>Replacing cereals (same to the following pulses)  | C35, Early S3, BGS-1  | Wilt and blight diseases   |   | N:20-25<br>(experim)  |  |
|             |  | Pigeon pea             | 2,158<br>( # )                               | 1,309<br>( # )                               | 0.61   |                                  |                                   |                              |   | 150-275<br>(av. 182)   |   |  | S103, Pusa Ageti, Sharda, Mukta, T-21   | Wilt disease   |   | N:20-21<br>(experim)  |  |
|             |  | Black gram             | 1,431<br>( # )                               | 456<br>( # )                                 | 0.32   |                                  |                                   |                              |   | 84-95(av. 91)  |   |  | Pusa-1, H-10, G-1   |  |   |   |  |
|             |  | Green gram             | 1,189<br>( # )                               | 292<br>( # )                                 | 0.25   |                                  |                                   |                              |   | 60-80(av. 66)  |   |  | Pusa Baisakhi, Jawahar-45, S-8, PS-7, G. 65   |  |   |   |  |
|             |  | Lentil                 | 727<br>( # )                                 | 339<br>( # )                                 | 0.47   |                                  |                                   |                              |   | 80-90(av. 87)  |   |  | Pusa-1-1, Pusa-6  |  |   | N:20-25<br>(experim)  |  |
|             |  | Cow pea                |  |  |  |                                  |                                   |                              |   |  |   |  | C-152, C-20   |  |   |   |  |
| Indonesia   | Sadikin, S.  | Soybean                | 601.6(av. '65-'69)                           | 410.2(av. '65-'69)                           | 0.68   | 2.53 ('71-'72)<br>(experimental) |                                   |                              |   | 80-110   | Rainfall: 1300-2400mm/year<br>Rain day: 95-122 days/year        | (1) As a second crop in rice fields.<br>(2) As a mixed crop & a catch crop in plantation.<br>(3) In the dry land in the rainy season.        | No.16, 27, 29, 317, 452, 520, 945, 1248   | Rust, Bacterial wilt, Sclerotial blight, Virus                             | Vegetative parts. ...<br>Phaedonia, Prodenia, Plusia, Longitarsus, Lamprosema, Agromyza, Stomopterox.<br>Generative parts. ...<br>Etiella, Phaedonia, Nezara, Riptortis |   |  |
|             |  | (Ground nut)           |  |  |  |                                  |                                   |                              |   |  | Soil: Alluvial Latosol Regosol                                  |  |   |  |   |   |  |
| Japan       | Metomiya & Ito, Saito, Matsumoto, & Oba, Takeuchi, Ebine, Saito & Watanabe | Soybean                | 100.5('71)                                   | 122.4('71)                                   | 1.22('71)  | 7.86('60)                        |                                   | 3,211.6('71)<br>(1,000 tons) | mid-May   late-Sep. (Hokkai)<br>mid-May   early-Oct. (do)<br>mid-May   mid-Sept. (Toho)<br>late-May   mid-Oct. (ku)<br>late-May   late-July (Kyu)<br>late-May   mid-Aug. (Kyu)<br>late-June   late-Oct. (shu)<br>early-July   late-Nov. ( # ) | 90-190   | Mean daily air temp. > 12°C                                     | Legumes - Legumes (Hokkaido)<br>Tobacco }<br>Millet }<br>Potato }<br>Wheat-Soybean (Tohoku)<br>Wheat }<br>Barley } Soybean(Kanto & westward) | Kitamumori, Toyosuzu, Raiden, Okushiro, Shiratae, Tachisuzumari, Akiyoshi Hyuga, Enrei.   | Purple speck, Virus, Sphaceloma scab.                                      | Stink bugs, Pod borer, Nematodes  | N:20-30,<br>K <sub>2</sub> O:40-1                                 |  |
|             |  | Peanut                 | 60.1('70)                                    | 124.2('70)<br>(unshelled)                    | 2.07('70)<br>(unshelled)   |                                  |                                   | 57 ('70)<br>(1,000 tons)     | early-May<br>late-May (Kanto)<br>late-April<br>mid-May (Kyushu)   |  | Sandy soil, Volcanic ash soil                                   |  | Spanish type - Southern cross, Hakuyu 7-3, Benhandachi<br>Virginia type - 334A, Chiba 43, Tachirakasei 1, Chiba handachi, Azumahandachi, Tokona, Wase-dairyu. | Leaf spot, Southern blight, Stem rot, Virus, Root rot, Rust.               | Nematode, Wireworm, Aphisp., Latronympho sp., Anomala sp.   | N:20-30<br>K <sub>2</sub> O:100                                   |  |
| Pakistan    | Batuch, M.K.   | Green and Black gram   | 2,620  | 748  | 0.33   | 1.0                              | about 20% of the total production |                              | June 1 - Sept. 30 (in upland)<br>August 1 - Nov. 30 (in plain)  | 100  | Air temp: 40-110°F<br>Annual precip.: 5-20 inches               | Rice-Mango<br>Mung-Sorghum   | No. 6066  | Ascochyte<br>Phaseolorum<br>Phylosticta                                    | Heliothis<br>Phytomyzachsanteum   | N:25<br>P <sub>2</sub> O <sub>5</sub> : 25<br>K <sub>2</sub> O: 0 |  |
|             |  | Chick pea              | 2,300  | 520  | 0.5  | 1.0                              | about 20% of the total production |                              | Oct. 15 - March 31 (in plain)   | 135  | Soil: Sanday, Sandy-loam, loam, Light clay                      | Rice-Chickpea-Rice<br>Chickpea-fallow<br>Sorghum-Chickpea  | Sanyase   | Mycosphaerilla<br>Fusarium   | Heliothis<br>Euprocites   | N:25<br>P <sub>2</sub> O <sub>5</sub> : 25<br>K <sub>2</sub> O: 0 |  |
| Philippines | Palo, A.V  | Mung bean              | 107 ('71-'72)                                | 12.5 ('71-'72)                               | 1.2-1.5 (dried seed)   |                                  |                                   |                              |   | 65-85 (dried seed)   |   |  | M.G. 50-10A, MD 15-2<br>BPI Glabrous No. 3,<br>Glossy Green S1, CES14, CES 55   |  |   |   |  |
|             |  | Yardlog bean           | 0.1 (Bush) ( # )<br>1.8 ( Pole ) ( # )       | 0.3 (Bush) ( # )<br>5.2 ( Pole ) ( # )       | 4.0-6.0 (green)  |                                  |                                   |                              |   | 50-65 (Pole, green)<br>40-50 (Bush, green)                   |   |  | Los Banos Sitao 1,<br>E.G. Bush Sitao 1 & 2,<br>E.G. Pole Sitao 1,<br>DES Pole Sitao 2  |  |   |   |  |
|             |  | Snap bean              | 3.9 ( # )                                    | 17.8 ( # )                                   | 5.0-7.0 (green)<br>0.8-1.5 (dried seed)                            |                                  |                                   |                              |   | 45 (green)<br>60-65 (dried seed)                             |   |  |   | Contender, Laws Champien, Tender Pod, Tender Green 406-B & 106A, Bush Type |   |   |  |
|             |  | Cow pea                | 1.0 ( # )                                    | 1.0 ( # )                                    | 5.0-6.0 (green)<br>1.5-1.8 (dried seed)                            |                                  |                                   |                              |   | 30-45 (green)<br>90-120 (dried seed)                         |   |  |   | E.G. Darkgreen Padded 1 & 2  |   |   |  |
|             |  | Garden pea             | 0.2 ( # )                                    | 0.8 ( # )                                    | 2.0-2.5 (green)<br>0.6-0.7 (dried seed)                            |                                  |                                   |                              |   | 70-80(green)   |   |  |   | Sugar Mamoth, Mira Green, Manda-taska, wilt                                |   |   |  |
| Sri Lanka   | Fernando, G.W.E.   | Green gram             |  | 1.74('70)                                    | (calcu. from table 3, 5, 6, 7)<br>11.0(rainfed)<br>1.50(irrigated) |                                  |                                   | 5.38('68)<br>(1,000 tons)    | (1) Maha season Oct.-Feb.<br>(2) Yala season Mar.-Sep.  |  | Dry zone (50-75 inches annual precip.)                          |  | V. C. 14, MI-1, MI-2, S16, S12, R. S 4  |  |   |   |  |
|             |  | Pigeon pea (Tour dhal) |  |  | 1.10-1.65  |                                  |                                   | 0.62('68)<br>(1,000 tons)    |   |  |   |  |   | T 64, T 85<br>Dwarf variety  | Pod borer   |   |  |
|             |  | Cow pea                |  | 0.54('70)                                    | 0.66-1.10 (rainfed)<br>2.20-2.75 (irrigated)                       |                                  |                                   |                              |   |  |   |  | Bombay, Arlington   |  |   |   |  |
|             |  | Black gram             | < 0.2  |  | 1.36 (rainfed)<br>2.64 (irrigated)                                 |                                  |                                   | 3.94('68)<br>(1,000 tons)    |   |  |   |  | MI-1, Wooly Puroi, Uffari 14  |  |   |   |  |
|             |  | Ground nut             | 4.6 ('68-'69)                                | 6.17('70)                                    | 1.69('70-'71) (rainfed)<br>4.27 ('71) (irrigated)                  |                                  |                                   |                              |   |  |   |  | A 20, A 22<br>Uganda erect,<br>Red Spanish,<br>Daiwa 1, No. 23  |  |   |   |  |
|             |  | Soyabean               | 4.8 ('72)                                    |  | 2.03(rainfed)<br>2.90 (irrigated)                                  |                                  |                                   |                              |   |  |   |  | Taichung E26 & E32,<br>Taichung 11,<br>TK 5, Hernon   |  |   |   |  |
| Thailand    | Arwooth, N.L.  | Mung bean              | 132('67)                                     | 1225('67)                                    | 0.90 (10 years average)  |                                  | 1.2mil. \$                        |                              | (1) Early rainy season planting May ~ June }<br>(2) Late rainy season planting late July ~ Aug }<br>(3) Dry season planting Jan. ~ with irrigation (without the case of peanut)   |  | 13-20°N. Lat.   |  | Varieties originated from Philippines   | Collar rot, Stem rot, Leaf spots, Virus.                                   | Bean flies, Leaf hoppers, Leaf rollers, Leaf cutters.   | N:20, P <sub>2</sub> O <sub>5</sub> : 40                          |  |
|             |  | Peanut                 | 107 ( # )                                    | 132 ( # ) (unshelled)                        | 1.26 ( # ) (unshelled)   |                                  | 1.8mil. \$                        |                              |   |  | Ditto   |  | Spanish type<br>Valencia type<br>Virginia type(recently)  | Collar rot, Stem rot, Leaf spots, Virus.                                   | Leaf hoppers, Leaf rollers, Leaf cutters.   | Ditto   |  |
|             |  | Soybean                | 63 ( # )                                     | 528 ( # )                                    | 0.90 ( # )   |                                  | 0.75mil. \$                       |                              |   |  | Ditto   |  | S-J-1, S-J-2  | Rust, Collar rot, Stem rot, Leaf spots, Virus.                             | Bean flies, Leaf rollers, Leaf cutters, Leaf hoppers.   | Ditto   |  |

