to 12.22%. The average stem rot mortality was comparatively low (16-20%) in summer crop but increased 18 to 26% in winter crop. The percentages of root and stem rot mortality in plantation of were initially low but had increased to 37.35% (summer crop) and 26% (winter crop) at Ranichauri.

**Sm08.251**

The ex situ Comparison of Two Improved St. John’s Wort (Hypericum perforatum L.) Cultivars with an Iranian Wild Population

*Crockett, S. 1; Azizi, M. 2; Ghani, A. 3; Ebadi, T. 3*

1. RANK-FRANKEN UNIVERSITÄT WURZBURG, INSTITUTE FOR PHARMACEUTICAL CHEMISTRY, DEPARTMENT OF PHARMACOGNOSY, 97074 WURZBURG, GERMANY
2. DEPARTMENT OF HORTICULTURE, COLLEGE OF AGRICULTURE, FERDows UNIVERSITY OF ISFAHAN, ISFAHAN, IRAN
3. ABDOLREZA UNIVERSITY IN BUSHIRE, BUSHIRE, IRAN

In this research, two improved cultivars of Hypericum perforatum (‘Gold’ and ‘Vepekon’) were compared with a wild Iranian population (Ardableh population) under common garden conditions in Iran. Plants were cultivated from seed in a greenhouse and seedlings were transplanted after one month to the field plots. The statistical design of this study was a Randomized Complete Block Design with three replications. During the period of full flowering, selected phenological (number of days to flowering), morphological (plant height, mean leaf area, number of black nodules/leaf) and chemical (hypericin and pseudohypericin content) characteristics were assessed. Our observations were that the ‘Vepekon’ cultivar is very sensitive to soil-borne diseases. All transplanted seedlings were infected by the plant pathogenic fungus Colletotrichum gloeosporioides (Penz.), which caused necrosis of the whole plant. Both the ‘Gold’ cultivar and plants from the wild population persisted despite mild infections with C. gloeosporioides and produced flowering shoots at both the first and second years after cultivation. The ‘Gold’ cultivar was superior to the Ardableh population in terms of phenological and morphological characteristics. The average naphthodianthrone contents (% dry weight of tissue) for the wild Iranian population were 0.09(±0.03)% but for the ‘Gold’ cultivar, 0.65(±0.12)%. These data indicate that selection and directed cultivation of Iranian H. perforatum plants can result in plants with improved morphological, phenological and chemical characteristics.

**Sm08.252**

Content and Chemical Composition of Essential Oil of ‘Alecirm-Pimenta’ in Manaus - Amazonas State, Brazil

*Chaves, F. C. M. 1; Chagas, A. C. S. 2; Souza, A. M. 3; Pinto, M. A. S. 4; Bizzo, H. R. 5*

1. EMBRAPA AMAZONAS OCCIDENTAL, E.M. 53, 69010-970 MANAUS, AMAZONAS, BRASIL
2. EMBRAPA FREIINÁRIA VENDEURO, R. 900, URBANIZAÇÃO SARGENTO, 30220-970 - SAO CARLOS, SÃO PAULO, BRAZIL
3. EMBRAPA AGROINDUSTRIA DE ALIMENTOS, AV. GENERAL RODRIGO OCHOA JORDIER, 8000, GUARUJA, SÃO PAULO, BRAZIL
4. NUCAMP SUL INDUSTRIA E COMÉRCIO LTDA., E.M. 53, 69010-970 - MANAUS, AMAZONAS, BRASIL
5. EMBRAPA CERRAS DE SÉRGIO, EMBRAPA PECUÁRIA SUDESTE, ROD. WASHINGTON LUZ, 239, CEP 330, 13560-970 - SÃO CARLOS, SÃO PAULO, BRAZIL

The family Papaveraceae globally presents 12-14 genera and about 1400 to 1950 species. For the chemical composition, regardless of spacing, it was found that the majority of the major constituents of the essential oil were thymol - 76.6%, ortho-cymene - 6.3%, beta-caryophyllene - 5.0%, gamma-terpinene - 2.0%, myrcene - 1.1%, 4-terpinol and Timile-methyl ether, both with 1.0%. Constituents be

**Sm08.253**

Biomass Production and Chemical Composition of Essential Oil of Piper callosus as Affected by Spacing in Manaus - Amazonas State, Brazil

*Chaves, F. C. M. 1; Campelo, A. B. 2; Mendonca, M. B. 3; Hidalgo, A. F. 4; Ming, L. C. 5; Bizzo, H. R. 6; Souza, A. M. 5; Pinto, M. A. S. 4*

1. EMBRAPA AMAZONAS OCCIDENTAL, E.M. 53, 69010-970, MANAUS, AMAZONAS, BRASIL
2. UNIVERSIDADE FEDERAL DO AMAZONAS, AV. G. G. BORGES DE ARAÚJO, 29-101, 69010-970, MANAUS, AMAZONAS, BRASIL
3. UNIVERSIDADE DE SÃO PAULO, FACULDADE DE CIÊNCIAS, 13560-970 - SAO CARLOS, SÃO PAULO, BRAZIL
4. EMBRAPA CERRAS DE SÉRGIO, EMBRAPA PECUÁRIA SUDESTE, ROD. WASHINGTON LUZ, 239, 13560-970 - SÃO CARLOS, SÃO PAULO, BRAZIL
5. EMBRAPA AGROINDUSTRIA DE ALIMENTOS, AV. GENERAL RODRIGO OCHOA JORDIER, 8000, GUARUJA, SÃO PAULO, BRAZIL
6. NUCAMP SUL INDUSTRIA E COMÉRCIO LTDA., E.M. 53, 69010-970 - MANAUS, AMAZONAS, BRASIL

The family Piperaceae presents 12-14 genera and about 1400 to 1950 species. The major constituents of the essential oil of Piper callosus were identified as alpha-tujeno, alpha-pinene, alpha-terpinene, limonene, 1,8-cineole, ipisulone, umbelulone, alpha-terpinol, alpha-copaene, aromadendrene, ledeno, delta-cadinene and oxide caryophyllene. The content of essential oil and its components showed values close to that found in the conditions of natural occurrence local of the species.