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Geographical Indication Characteristics and Agricultural Intellectual Property Protection of the Tea in Enshi Prefecture

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Abstract Agricultural intellectual property rights can protect the innovation of agricultural science and technology. Enshi Prefecture is China's important tea-producing area. Its tea industry has become a pillar industry. The prefecture enjoys a reputation of "world selenium capital", and is the best birthplace of natural selenium-enriched tea. The national geographical indication protection has been implemented for Enshi Yulu Tea, Enshi selenium-enriched tea, Wujiatai Tribute Tea, Hefeng Tea, Mapo Tea, etc. This paper introduces the geographical indication characteristics and agricultural intellectual property protection of the tea in this world selenium capital, analyses the countermeasures for agricultural intellectual property protection, and puts forward some constructive suggestions.

Key words Enshi Prefecture, World selenium capital, Natural selenium-enriched tea, Geographical indication, Agricultural intellectual property

1 Introduction

To implement *National Intellectual Property Strategy Outline*, the Chinese Ministry of Agriculture issued *Agricultural Intellectual Property Strategy Outline (2010 – 2020)* on June 10, 2010, which enhanced technical support for agricultural development. The Central Document No. 1 in 2012 highlighted the importance of agricultural science and technology, and made the overall arrangement for agricultural science and technology innovation^[1]. Therefore, we need to use the agricultural intellectual property to protect the agricultural science and technology innovation^[2–4].

The agricultural intellectual property includes agriculture-related patents, trademarks, copyrights, new plant varieties, geographical indication, genetic resources, traditional knowledge, and agricultural trade secrets^[5–7]. Among them, geographical indication (GI) is the name or sign used on certain products which corresponds to a specific geographical location or origin (e. g. a town, region, or country), mainly determined by the natural factors or human factors in the region^[8–10]. The use of a GI may act as a certification that the product possesses certain qualities, is made according to traditional methods, or enjoys a certain reputation, due to its geographical origin. Enshi Tujia and Miao Autonomous Prefecture is located in the mountainous southwestern corner of Hubei Province, People's Republic of China. It forms Hubei's southwestern "panhandle", bordering on Hunan in the south and Chongqing Municipality in the west and northwest.

The Yangtze River crosses the prefecture's northeastern corner in Badong County. Enshi Prefecture is located in the mountainous belt separating Hubei's Jiangnan Plain from the Sichuan Basin. It is one of China's important tea-growing areas. Hefeng

County, Enshi City, Xuan'en County, Lichuan City, and Xianfeng County, were all included in 2013 National Key Tea Producing Counties (Top 100), and ranked 17th, 23rd, 34th, 37th and 59th, respectively.

The national geographical indication protection has been implemented for Enshi Yulu Tea, Enshi selenium-enriched tea, Wujiatai Tribute Tea, Hefeng Tea, and Mapo Tea. Enshi Prefecture has the resource advantages for the development of tea industry (especially natural selenium-enriched tea industry), and the tea industry has become a pillar industry. So in this article, we study the tea geographical indication characteristics and agricultural intellectual property protection measures in the world selenium capital-Enshi Prefecture.

2 Geographical indication factors and intellectual property of tea in Enshi Prefecture

2.1 Natural factors of geographical indication

2.1.1 Zone suitable for the growth of hygrophilous tea plant. Enshi has a monsoon-influenced humid subtropical climate, with short, cool winters, hot, humid summers, and high humidity year-round.

The monthly 24-hour average temperature ranges from 5.0 °C (41.0 °F) in January to 26.7 °C (80.1 °F) in August, while the annual mean is 16.18 °C (61.1 °F). More than two-thirds of the annual precipitation of 1470 millimeters occurs from May to September.

With monthly percent possible sunshine ranging from 12% in January to 50% in August, the prefecture seat receives only 1212 hours of bright sunshine annually; winter is especially overcast while July through September is the sunniest period of the year.

The soil in Enshi is rich in selenium. Enshi is known as the "selenium capital of China" and is the world's sole independent selenium deposit. Much of the mountain landscape is covered in virgin forest and is home to pangolins.

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Due to the complex terrain and great terrain height disparity, there are very distinct climatic vertical geographical differences. Heat and temperature fall with the rising terrain; the gurgling spring, high mountains, and the acidic to slightly acidic soil, contribute to the growth of hygrophilous tea plant.

2.1.2 Green environment. Enshi is an agricultural autonomous prefecture with a small population. It has picturesque scenery and the forest coverage rate reaches 70%. It is the core area of Western Hubei Ecological and Cultural Tourism Circle, and the national natural forest protection project area.

The forest resources are particularly rich in the region, with a total of 171 families, 645 genera and 1264 species. There are about 40 national key protected rare species including Chinese dove tree, katsura tree and Henry Emmenopterys, accounting for 90% of national key protected species in the province.

2.1.3 Natural selenium-enriched agricultural geological environment. The soil in Enshi is rich in selenium. Enshi is known as the "selenium capital of China"^[11] and is the world's sole independent selenium deposit. It is recognized as the best origin of natural selenium-enriched tea. The natural selenium-enriched soil is widely distributed in Enshi, and there are mainly two genetic types: (i) stone coal type; (ii) fire coal type.

The selenium content of coal from Longtan coal-bearing strata is 2.4–20.0 mg/kg^[12] in the prefecture. The selenium-enriched rock, selenium-enriched soil, selenium-enriched mineral water, and selenium-enriched animal and plant resources gather together to form the natural selenium-enriched geological environment and selenium-enriched biosphere.

2.1.4 High quality tea varieties The major tea varieties planted in Enshi Prefecture are the introduced national high quality tea varieties, Fuding White Tea, Longjing 43 and E – Cha 1, and excellent local tea varieties, Enshi Yulu Tea 1, E – Cha 10, Entai 1, Entai 2, Xuanen 27, Enchahong, and Maobazao, etc.

2.1.5 Selenium enrichment and other quality characteristics of tea. Selenium (Se) is the third essential trace element determined by WHO for human health^[13], and more than forty kinds of diseases are associated with human selenium deficiency.

Enshi tea is rich in selenium, with the content as high as 7.53 mg/kg^[14]. In addition to selenium enrichment, Lulin Cuifeng, Wujiatai Luzhen, Enshi Huazhi Tea, Enshi Yulu Tea, and other famous green tea also have many other excellent characteristics, such as fragrance, good taste, green color and beautiful shape.

2.2 Human factors of geographical indication

2.2.1 The long history of tea cultivation. The cultivation of tea in Enshi Prefecture has a long history. According to the records of Jin Dynasty, the tea in Wuling was the best and the tea in Badong was fragrant and impressive. As early as 1700 years ago, Enshi tea entered the palace.

2.2.2 Ancient tea producing technology. The steamed green tea is the finished green tea obtained by using steam to remove tea water. It was a type of tea first invented in ancient China. Enshi

Yulu Tea and Dangyang Cactus Tea are the only remaining few steamed green tea varieties.

The tea producing technology of steamed green tea retains more chlorophyll, protein, amino acids and aromatic substances. Enshi Yulu Tea is one type of the few preserved steamed green tea, and its production process and tools used are quite old, similar to the records of *The Classic of Tea*^[15].

2.2.3 Tribute tea culture. The founder of Wujiatai Tribute Tea, Wu Changchen, painstakingly cultivated tea in Wujiatai of Xuan'en County, and the white tea produced by him was sweet, clear, bright, green and fragrant.

Because of these advantages, it was gradually known far and wide, and officials and gentry fell over each other in eagerness to buy it. As a tribute, it was presented to Qianlong Emperor who became elated after sipping the tea and offered plaque as the award^[16].

2.2.4 Famous tea brand. Since early Qing Dynasty, Wujiatai Tribute Tea has long enjoyed a good reputation, for its high historical, artistic and scientific value. Enshi Yulu Tea was chosen as "Top Ten China Famous Tea" in 1965, and was awarded the plaque "Hubei First Historical Famous Tea" in 2009.

Yihong Black Tea is one of the top ten black tea varieties in China, and the growing area of Yihong Black Tea is a famous tea growing area in China with a long history.

2.2.5 Rich tea cultural heritage. Enshi Prefecture has rich tea cultural heritage. The traditional tea producing technology of Enshi Yulu Tea, Wujiatai Tribute Tea and Yihong Black Tea is important intangible cultural heritage^[17]; "Enshi Yulu Tea Dong Tea Culture System", an important agricultural system, is intangible cultural heritage^[18].

2.2.6 Standardized production and green ecological development. In 2005, Agricultural Bureau of Enshi Prefecture issued Pollution-free Tea Standardized Production Technology. The national standardized production base project of green food raw materials (tea) established in Hefeng County was inspected and then accepted by the expert group on September 28, 2010; national agricultural standardization demonstration area project of Enshi tea cultivation was examined and accepted on October 15, 2013. Enshi Yulu Tea, Enshi selenium-enriched tea, Wujiatai Tribute Tea, Hefeng Tea, and other national geographical indication products, all have the corresponding quality standards.

Hefeng County and Xuan'en County were awarded "2012 National Top Ten Eco-tea-producing County", and "2013 National Top Ten Eco-tea-producing County", respectively.

2.3 Intellectual property protection

2.3.1 Geographical indication. In the seven major types of intellectual property rights covered by the TRIPS Agreement, geographical indication, as an independent type of intellectual property, is provided in special sections. It is one of the three topics of the Doha Round of negotiations on intellectual property^[5], and a hot topic drawing widespread attention.

Geographical indication rights are an important part of agri-

cultural intellectual property, mainly for the intellectual property protection of traditional famous and high – quality specialty (the specialty in a broad sense, such as agricultural products, wine, food, arts and crafts, textile). Geographical indication and origin naming system have had more than 100 years of history.

France is one of the birthplaces of the system. From the beginning, France mainly used the system to protect champagne and other types of liquor produced at home. However, China's geographical indication protection system was implemented in 1995, with serious conflicts and high degree of repeat. There were mainly five geographical indication protection systems successively.

Currently, there are still three of them as follows:

(i) The geographical indication product protection of the State Administration of Quality Supervision, Inspection and Quarantine;

(ii) The geographical indication trademark registration of the State Administration for Industry and Commerce;

(iii) The agricultural product geographical indication registration of the Ministry of Agriculture.

The tea in Enshi Prefecture implementing the geographical indication product protection of the State Administration of Quality Supervision, Inspection and Quarantine includes Enshi Yulu Tea, Wujiatai Tribute Tea, and Hefeng Tea; the tea in Enshi Prefecture implementing the geographical indication trademark registration of the State Administration for Industry and Commerce includes Enshi selenium-enriched tea, Enshi Yulu Tea, Hefeng Green Tea, and Wujiatai Tribute Tea; the tea in Enshi Prefecture implementing the agricultural product geographical indication registration of the Ministry of Agriculture includes Hefeng Tea, Wujiatai Tribute Tea, and Mapo Tea.

2.3.2 Trademark. A trademark, trade mark, or trade-mark is a recognizable sign, design or expression which identifies products or services of a particular source from those of others.

The trademark owner can be an individual, business organization, or any legal entity. A trademark may be located on a package, a label, a voucher or on the product itself. A trademark is typically a name, word, phrase, logo, symbol, design, image, or a combination of these elements.

There is also a range of non-conventional trademarks comprising marks which do not fall into these standard categories, such as those based on color, smell, or sound. The term trademark is also used informally to refer to any distinguishing attribute by which an individual is readily identified, such as the well-known characteristics of celebrities.

When a trademark is used in relation to services rather than products, it may sometimes be called a service mark, particularly in the United States. The tea in Enshi Prefecture has registered dozens of trademarks, and for the enterprises approved by the state to use the special sign of Wujiatai Tribute Tea as a national geographical indication product, there are a total of 14 trademarks (Table 1).

The geographical indication trademark is the mark shows

where a commodity comes from, which can indicate the particular quality, reputation or other characteristics of this commodity are mainly determined by the natural factors or human factors in this area.

Table 1 The enterprises approved to use the special sign of Wujiatai Tribute Tea and the corresponding trademarks

Enterprises	Trademarks
Xuan'en Wujiatai Changchen Tea Co. , Ltd.	Changchen, Qianlong BHDW
Xuan'en Qingjiang Mingliu Industrial Co. , Ltd.	Yishui Yulu
Enshi Wujiatai selenium-enriched Tribute Tea Co. , Ltd.	Huang'en Chongxi
Xuanen Jinhe Tribute Tea Co. , Ltd.	Guizhen, Jinggong
Hubei Kangqian Gongyu Tea Co. , Ltd.	Gongyu
Xuan'en Wujiatai Chang Jin Tea Processing Factory	Chang Jin
Xuan'en Huanggong Tea Co. , Ltd.	Huanggong
Xuan'en Qizimeishan Mountain Tea Cooperative	Qizimeishan Mountain
Xuan'en Xiaoguan Dong Weimin Tea Cooperative	Weimin
Xuan'en Xuantao Tea Co. , Ltd.	
Xuan'en Jiaoyuan Caihua Tea Cooperative	Xuanlu
Hubei Luke Eco-tea Co. , Ltd.	Yishui Yulu
Xuan'en Baotai Tribute Tea Co. , Ltd.	Shiyuan

Applying for the geographical indication trademarks is a common practice at present for protecting the specialty products in the international community (especially the United States, Germany, etc.). Through the application of geographical indication trademarks, we can reasonably and fully use and preserve natural resources, cultural resources and geographical heritage, effectively protect the high-quality specialty products, and promote the development of characteristic industry.

Enshi tea has 4 national geographical indication trademarks: Enshi selenium-enriched tea, Enshi Yulu Tea, Hefeng Green Tea, Wujiatai Tribute Tea. Famous trademark refers to the registered trademark with higher market reputation and commercial value, recognized by law. Among Enshi tea trademarks, there are 18 trademarks in Hubei Province (Table 2). However, there is not yet any well-known trademark of Enshi tea in China.

2.3.3 Patent. A patent is a set of exclusive rights granted by a sovereign state to an inventor or assignee for a limited period of time in exchange for detailed public disclosure of an invention.

An invention is a solution to a specific technological problem and is a product or a process. Patents are a form of intellectual property. In terms of production, making and deep processing, Enshi tea has a total of 30 national patents (Table 3).

2.3.4 Agricultural genetic resources. Genetic resources are important national strategic materials, and the basic resources related to the national economy. The generation of genetic resources is not an overnight thing, but a long-term process. Enshi Tai tea is an important agricultural biological genetic resource.

Entai 1 and Entai 2 are cultivated from Badong Xiqiwan Tai tea group of varieties and Hefeng Tai tea group of varieties using single plant breeding method. E – Cha 10 is bred from the Enshi

Tai tea group of varieties. The large-scale promotion of high quality tea varieties (especially exotic varieties) poses direct threat to Enshi Tai tea group of varieties.

Table 2 Famous trademarks of Enshi tea in Hubei Province and the enterprise list

Famous trademarks in Hubei Province	Enterprises	City or county
Huaya	Badong Huaye Industrial Co. , Ltd.	Badong County
Jinguo	Hubei Badong Jinguoping Tea Co. , Ltd.	
Zhenxiangming	Hubei Zhenxiangming Ecological Agriculture Development Co. , Ltd.	
Huazhi	Enshi Huazhi Mountain Ecological Agriculture Development Co. , Ltd.	Enshi City
Bajiao	Enshi Runbang International Se-enriched Tea Co. , Ltd.	
Xidu	Enshi Specialty Development Company	
Hualongcun	Hubei Hualongcun Tea Co. , Ltd.	
Qilong	Hubei Hefeng Qilong Tea Co. , Ltd.	Hubei County
Hongluo	Hubei Hefeng Shiwei Tea Co. , Ltd.	
Baiguo	Hefeng Baiguo Minzu Tea Processing Factory	
Cuiquan	Hubei Hefeng Cuiquan Tea Co. , Ltd.	
Xingdoushan	Lichuan Feiqiang Tea Co. , Ltd.	Lichuan City
Fuxi	Lichuan Xiyuan Tea Co. , Ltd.	
Xingdou Luyu	Lichuan Xingdou Tea Co. , Ltd.	
Rentoushan	Xianfeng Rentoushan Tea Co. , Ltd.	Xianfeng County
Huang'en Chongxi	Enshi Wujiatai Se-rich Tribute Tea Co. , Ltd.	Xuanen County
Huanggong	Xuanen Huanggong Tea Co. , Ltd.	
Changchen	Xuanen Wutai Changchen Tea Co. , Ltd.	

Table 3 National patents of Enshi tea

National patents	Applicants
One kind of pine needle tea	Enshi Jiuyan Pharmaceutical Technology Development Co. , Ltd.
The health tea of corn silk and dandelion and preparation method	Enshi Juxin Modern Agriculture Development Co. , Ltd.
One kind of tea processing method	Enshi Runbang International Se-enriched Tea Co. , Ltd.
One kind of alcohol – based fuel tea oven	Enshi Shuofan Tea Machine Manufacturing Co. , Ltd.
One kind of alcohol – based fuel tea water-removing stove	
One kind of orange scented tea and preparation method	Enshi Xilu Tea Co. , Ltd. , Enshi Qingjiang Tea Co. , Ltd.
One kind of tea resurgence machine	Enshi Academy of Agricultural Sciences
One kind of fresh tea leave vibration and grading machine	
One kind of tea cultivation method suitable for mechanization management	
One kind of needle-or-strip-shaped tea shaping machine	
One kind of Chinese scholar tree flower tea and preparation method	Enshi Railway International Travel Service Co. , Ltd.
One kind of orange tea and preparation method	
One kind of grapefruit tea and preparation method	
One kind of citron tea and preparation method	
One kind of selenium-enriched scented tea and its production method	Enshi Juxikang Agricultural Science and Technology Co. , Ltd.
One kind of selenium-enriched laxative and health tea and its production method	
One kind of selenium-enriched spirit-fostering tea and its production method	
One kind of selenium-enriched stomach-nourishing tea and its production method	
One kind of selenium-enriched blood-nourishing tea and its production method	
One kind of fat-reducing selenium-enriched tea and its production method	
Buds with pearl artisan tea and its production method	Lichuan Fenghuang Minzu Tea Co. , Ltd.
Orbital tea picking machine	Long Zhaoxian
One kind of tea shearing and grinding machine	Tan Dohong
One kind of Sanjian pine needle tea and its preparation method	Tan Minghong
One kind of tea picking machine	Tu Shaoxian
One kind of selenium-enriched tonic tea	Wu Shumin
Natural tea preservative and preservation methods	Wu Yongyao
A technology approach of extracting polysaccharides and polyphenols mixed crystal	Yan Liangrong
Bags (tea)	Yi Jibin
Tea picking machine	Yi Tao

2.3.5 Traditional knowledge. Traditional knowledge (TK) , indigenous knowledge (IK) , traditional ecological knowledge (TEK) and local knowledge generally refer to knowledge systems embedded in the cultural traditions of regional , indigenous , or local communities.

Traditional knowledge includes types of knowledge about traditional technologies of subsistence (e. g. tools and techniques for hunting or agriculture) , midwifery , ethnobotany and ecological

knowledge , celestial navigation , ethnoastronomy , the climate , etc. These kinds of knowledge are crucial for the subsistence and survival and are generally based on accumulations of empirical observation and interaction with the environment.

The traditional production techniques of Enshi Yulu Tea , Wujiatai Tribute Tea and Enshi Yihong Black Tea are valuable intangible cultural heritage , and contain a lot of traditional knowledge . However , The traditional production techniques of Enshi tea

have not yet been included in National-level Intangible Cultural Heritage List, and there are only two items (making skills of Enshi Yulu Tea and making skills of Xuan'en Wujiatai Tribute Tea) included in Hubei Provincial Intangible Cultural Heritage List.

2.3.6 New varieties of plants. New varieties of plants are the novel, distinct, uniform and stable varieties of plants through artificial cultivation or development of discovered wild plants. In 1999, China joined the International Union for the Protection of New Varieties of Plants (UPOV).

The researchers of tea in Enshi Prefecture have bred some novel, distinct, uniform and stable appropriately named varieties of tea in recent years, but they have not yet applied for the protection of new varieties of plants.

3 Conclusions and recommendations

3.1 Conclusions Enshi Prefecture has the resource advantages for the development of tea industry (especially natural selenium-enriched tea industry), and the tea industry has become a pillar industry. The natural factors of geographical indication of tea in this prefecture mainly include zone suitable for the growth of hygrophilous tea plant; green environment; natural selenium-enriched agricultural geological environment; high quality tea varieties; selenium enrichment and other quality characteristics of tea.

The human factors include the long history of tea cultivation; ancient tea producing technology; tribute tea culture; famous tea brand; rich tea cultural heritage; standardized production and green ecological development. There are 3 kinds of national geographical indication products, 4 national geographical indication trademarks and 3 kinds of national agricultural geographical indication for the tea in Enshi Prefecture.

The tea in Enshi Prefecture has registered dozens of trademarks, and for the enterprises approved by the state to use the special sign of Wujiatai Tribute Tea as a national geographical indication product, there are a total of 14 trademarks. Enshi tea has 4 national geographical indication trademarks; Enshi selenium-enriched tea, Enshi Yulu Tea, Hefeng Green Tea, Wujiatai Tribute Tea.

Among Enshi tea trademarks, there are 18 trademarks in Hubei Province. However, there is not yet any well-known trademark of Enshi tea in China. In terms of production, making and deep processing, Enshi tea has a total of 30 national patents. Enshi Tai tea is an important agricultural biological genetic resource.

The traditional production techniques of Enshi Yulu Tea, Wujiatai Tribute Tea and Enshi Yihong Black Tea are valuable intangible cultural heritage, and contain a lot of traditional knowledge. There are only two items (making skills of Enshi Yulu Tea and making skills of Xuan'en Wujiatai Tribute Tea) included in Hubei Provincial Intangible Cultural Heritage List.

The researchers of tea in Enshi Prefecture have bred some novel, distinct, uniform and stable appropriately named varieties of tea in recent years, but they have not yet applied for the protection of new varieties of plants.

3.2 Recommendations

3.2.1 Carrying out large-scale geological survey of ecological agriculture in major tea-growing areas to reveal the selenium enrichment and other natural factors of geographical indication.

For various reasons, the agricultural geological work was started late in Enshi Prefecture. According to rough statistics, the area of selenium-enriched soil ($>0.4\text{mg/kg}$) takes up 60.9% of the whole area of Enshi Prefecture.

Different from Jiangnan Plain, Enshi Prefecture has a complex agricultural geological environment, obviously affected by the bedrock type and topography. So it is necessary to carry out large-scale geological survey of ecological agriculture on Enshi Yulu Tea, Enshi selenium-enriched tea, Wujiatai Tribute Tea, Hefeng Tea and Mapo Tea in major tea-growing areas, and evaluate the ecological and geological conditions for regional agriculture, to reveal the selenium enrichment and other natural factors of geographical indication.

3.2.2 Researching the human factors of geographical indication of traditional famous tea and protecting the cultural heritage of tea. The human factors of geographical indication of traditional famous tea include intangible cultural heritage, tangible cultural heritage (especially traditional agricultural systems), etc. So it is necessary to research the unique production technology and processes in the origin of some traditional famous tea, such as Enshi Yulu Tea, Hefeng Green Tea, Wujiatai Tribute Tea and Enshi Yihong Black Tea, apply for the national intangible cultural heritage projects of making skills of Enshi Yulu Tea, Hefeng Green Tea, Wujiatai Tribute Tea and Enshi Yihong Black Tea, carry out the productive protection of intangible cultural heritage and carry on with the traditional knowledge of tea making.

3.2.3 Implementing the geographical indication intellectual property protection for Enshi Yihong Black Tea and carrying on with the brand heritage of hundred-year history.

Yihong Black Tea, a famous brand with a hundred-year history, is brand cultural heritage. Like Yichang City, Enshi Prefecture is also a major producing area of Yihong Black Tea.

However, Enshi Prefecture has not any national geographical indication of black tea and famous black tea brand, so it is necessary to implement intellectual property protection of geographical indication of Enshi Yihong Black Tea:

(i) implementing the geographical indication product protection of the State Administration of Quality Supervision, Inspection and Quarantine for Enshi Yihong Black Tea;

(ii) implementing the geographical indication trademark registration of the State Administration for Industry and Commerce for Enshi Yihong Black Tea;

(iii) implementing the agricultural product geographical indication registration of the Ministry of Agriculture for Enshi Yihong Black Tea.

3.2.4 Identifying four China's time-honored brands and carrying on with the traditional knowledge of tea making. China's time-honored brand is an honored title granted by the Ministry of Commerce

of China to enterprises in mainland China, whose brand has a long history, products, techniques or services passed down through generations, has strong Chinese culture background and characteristics, and is widely recognized by the society.

Enshi Runbang International Selenium-enriched Tea Co., Ltd., Enshi Wujiatai Selenium-enriched Tribute Tea Co., Ltd., Lichuan Feiqiang Tea Co., Ltd., and Hubei Hefeng Cuiquan Tea Co., Ltd., own the China's time-honored brands of Enshi Yulu Tea, Wujiatai Tribute Tea, Hefeng Green Tea and Enshi Yihong Black Tea, respectively.

Therefore, it is necessary to identify the four China's time-honored brands and carry on with the traditional knowledge of tea making of Enshi Yulu Tea, Wujiatai Tribute Tea, Hefeng Green Tea and Enshi Yihong Black Tea.

3.2.5 Encouraging the reporting of national patents and new varieties of plants, and protecting the scientific and technological innovation of tea. In terms of production, making and deep processing, Enshi tea has 30 national patents (Table 3), but few of them are innovative and practical at the same time. The prefecture has not yet applied for the protection of new varieties of tea plants.

So it is necessary to encourage the research and development on tea production, tea making and deep processing, support the tea breeding, encourage the reporting of national patents and new varieties of plants, and protect the scientific and technological innovation of tea.

3.2.6 Choosing geographical indication as the strategic brand and integrating the regional public brands of tea. Clearly, geographical indication is the brand itself. Geographical indication can be commonly used by all enterprises and individuals in the origin of goods, and as long as the goods have the quality of products represented by geographical indication, there will be more than one person using the same geographical indication in the same area.

Therefore, it is necessary to improve the intellectual property protection of geographical indication of Enshi green tea, strengthen the geographical indication protection of black tea, Oolong tea and dark tea, choose the tea geographical indication as strategic brand, and effectively integrate the regional public brands of tea.

3.2.7 Focusing on cultivating the brands of Enshi selenium-enriched tea, Enshi Yulu Tea, Hefeng Green Tea, Wujiatai Tribute Tea and Enshi Yihong Black Tea and striving for the certification of five Chinese famous trademarks.

Enshi tea only has 18 famous trademarks in Hubei Province, but it has no famous trademark in China (Table 2). Currently, there are 4 national geographical indication trademarks: Enshi selenium-enriched tea, Enshi Yulu Tea, Hefeng Green Tea, and Wujiatai Tribute Tea.

Obviously, the existing 18 famous trademarks in Hubei Province are difficult to be upgraded to the Chinese well-known trademarks, due to small scale of commodity production.

Therefore, it is necessary to accelerate the registration of national geographical indication trademark "Enshi Yihong Black

Tea", focus on cultivating the brands of Enshi selenium-enriched tea, Enshi Yulu Tea, Hefeng Green Tea, Wujiatai Tribute Tea and Enshi Yihong Black Tea and strive for the certification of five Chinese famous trademarks.

3.2.8 Establishing tea germplasm garden and protecting the local genetic resources of tea. Enshi Tai tea is an important agricultural biological genetic resource. In order to prevent the threat of introduced Fuding White Tea, Longjing 43 and E-Cha 1 to local germplasm resources, it is necessary to establish Enshi tea germplasm garden to protect local tea genetic resources, and develop the tourism resources of tea plantation.

3.2.9 Promoting agricultural intellectual property and cultivating the new agricultural operating subjects' intellectual property protection awareness. With the continuous development of agriculture and rural economy in China, the new agricultural operation subjects represented by the cooperatives, family farms and agricultural enterprises, increasingly show great vitality and potential of development.

Therefore, it is necessary to promote agricultural intellectual property to the public in Enshi Prefecture, and especially tea farmer cooperatives, tea family farms and tea leading enterprises, and cultivate the new agricultural operating subjects' intellectual property protection awareness.

3.2.10 Strengthening the production of selenium-enriched tea and playing the unique selenium-enriched resource advantages of "world selenium capital". Enshi Prefecture is recognized as "world selenium capital", and selenium-enriched tea is its important competitive tea product.

Therefore, it is necessary to strengthen selenium fertilizer mineral resources survey and exploration, conduct selenium fertilizer production, and strengthen the selenium-enriched land improvement in the major tea-growing areas and large-scale standardized production of selenium-enriched tea.

3.2.11 Vigorously integrating tea production enterprises to be listed in the stock market. The production scale of tea enterprises in Enshi Prefecture is small in general, and the funds are limited, which is not conducive to building intensive, professional, organizational and socialized new agricultural operation system.

Therefore, under the guidance of the prefecture government, it is necessary to strengthen the integration of tea production enterprises to form World Selenium Capital Tea Co., Ltd., and actively strive to be listed in the stock market.

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4.5 Reporting the nationally and globally important agricultural cultural heritage

Yellow tea is an old tea, originating much earlier than dark tea, scented tea, white tea, green tea, *etc.* Mengding Huangya, Junshan Yinzhen, Yuan'an Luyuan tea and other yellow tea varieties originated from the Tang and Song dynasties.

Mengshan Huanghuang tea garden and tea culture system, Junshan tea garden and yellow tea culture system, and Yuan'an Luyuan tea and Buddhist culture system and other agricultural cultural heritage systems of yellow tea all reach China Important Agricultural Heritage and Globally Important Agricultural Heritage Standards, so they should strengthen the reporting to be included in the GIAHS and CIAHS list.

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