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CHINA: THE NEXT HUGE PEAT AND GROWING MEDIA MARKET IN THE WORLDMeng Xianmin^{1,2,3}¹*China National Committee, International Peatland Society, China*²*Peat Industry Association Branch, China Humic Acid Industry Association, China*³*Institute for Peat and Mire Research, Northeast Normal University, China***Corresponding author: mengxm3711@163.com***SUMMARY**

The demand for peat for different uses in China is estimated according to the crop area and peat need per ha. The data show that China is one of biggest new potential markets for peat in the world. The total demand of growing media for growing seedlings in China is about 49.51 million cubic meters per year. The total demand for growing media for soilless cultivation including vertical greening, home gardening, roof garden media and growing plants on balconies is about 20.25 million cubic meters per year. The total demand for peat as a soil improver for degenerated greenhouse soils is about 110 million cubic meters each year. The total demand of peat for functional fertilizer is about 72.4 million cubic meters per year. The total estimated peat demand in China is about 250 million cubic meters for all possible applications. Although China is rich in peat resources with a total deposit of 12.4 billion cubic meters, 99% of the total is eutrophic peat, predominantly sedge and reed peat and only 1% oligotrophic peat. In order to meet the estimated demand it will be essential to import *Sphagnum*-based peat. In 2014 more than 1 million cubic meters of *Sphagnum* peat were imported; that equals the annual amount of peat being extracted in China. The total amount of imported peat will reach 10-20 million cubic meters per year within the next 5-10 years. In spite of importing peat and coconut coir, new technologies and modern machinery are needed. This would include the import of sophisticated growing media manufacture technology, manufacture lines and packaging equipment, growing media additives like wetting agents, different types of fertilizers and various devices and equipment for soilless cultivation. Furthermore, in future Chinese manufacturers of growing media will need to certify their products as responsibly sourced and manufactured. These objectives are a huge opportunity for foreign companies to get involved in setting up a modern Chinese growing media industry. The strategy of the Chinese peat industry is to foster the ability of sustainable development, to use *two* peat resources- domestic as well as imported peat, to depend on *three* means, being technology, market and information, to enhance the production of *four* peat product groups, namely growing media, peat-based soil improvers, functional fertilizer and peat-based medical products and treatments and – last but not least – obtain support via *five* essential tools innovation, machinery, peat and growing media standards, quality management and industry management. The main aim of the Chinese peat industry is to reach the production and quality level of western countries in the next 5-10 years.

Keywords: *peat, growing media, Chinese market, allocation of peat resources, China*

INTRODUCTION

The peat industry of China is emerging and turning a highway 20 years after starting. Together imported *Sphagnum* peat and domestic fen peat have reached a total production of 2 million cubic meters in 2014. Peat use in China is welcomed due to its characteristics of being clean and risk-free in use. The amounts of peat per area of application vary significantly depending on crop types and sown area. Sometimes, governmental politics and public awareness deeply affect the peat market in China. As the economic transition and green development in China are going ahead, peat use in China will receive more and more attention. But although China is rich in eutrophic peat, it unfortunately lacks *Sphagnum* peat which is much more favorable for horticultural applications. Therefore, information on the demand for peat in China in the next 5-10 years and what kind of peat products are needed is very important for the Chinese government to develop a peat industry strategy and for foreign peat companies to expand their peat market in China.

METHODS

All data was collected from the China National Statistical Year book 2014, China Agricultural Statistical Yearbook 2014, the development plan of China watermelon and sweet melon 2014-2020 and the China flower industry yearbook. All data of peat application rates in each unit is based on the averages of different regions. All data regarding the future of the industry comes from the document of the State Council and different ministries.

RESULTS

Demand for Growing Media for the Seedling Industry

In China most growing media are used in seedling nurseries. The most important seedling crops are vegetables (cucumber, tomato, eggplant and pepper), water melon, sweet melon, tobacco, tree, rice and floricultural crops. Amongst these crops, the largest area is used for growing rice seedlings. The application of growing media in rice seedling nurseries is emergent and growth rates are high. Second to rice cultivation is vegetable growing, being a traditional industry with high demands. Seedling nurseries that grow water melon and sweet melon occupy a very large area because both melons are main fruit crops in northern China. In general, the amount of growing media used in seedling nurseries accounts for 95% of the total growing media usage. However, the future demand for professional growing media takes account for a total of 45.91 million cubic meters – the current amount used is 3.50-4.50 million cubic meters. The enormous data gap implies a huge market potential for growing media.

Table 1: Demand of growing media for nursing industry

Types	Area (10 ³ ha)	Amount (m ³ /ha)	Demand(10 ³ m ³)
Amenities vegetable	2,660	3.8	10,108
Water melon	1,801.5	0.58	1,044.87
Sweet melon	4,100.4	2.4	9,840.96
Tobacco	1,225	0.68	833
Trees	3,850	0.08	308
Rice	30,310	1.5	22,733
Flowers	1,227.1	1.7	1,043
Total			45,910

Greenhouse growing is a main target market for growing media in the seedling industry. The growth trend of greenhouse area presents the dynamic process of demand increase of professional growing media in China. The area of greenhouses was 254.1 thousand ha in 2008, the figure increased up to 696.5 thousand ha in 2014. The demand for growing media in 2008 was 965.6 thousand cubic meter sand 2.64 million cubic meters in 2014, respectively.

The area change of greenhouse locations in geographical terms shows different trends in Northern China, Northeast China, Eastern China, Center China and Northwest China. Northern China, Northeast China and Northern China not only are great in greenhouse area, but also area increase is fast; these three regions represent the main market of growing media for the seedling industry. As Northwest China poses arid, sandy, salinity land, the demand for growing media in that region will increase rapidly as the application of new technologies and financial input will increase.

The Demand for Growing Media for Soilless Culture

Soilless culture is very new industry in China and most soilless cultivation techniques are hydroponics and mineral wool cultures. Vegetable crops in growing media have continued to advance during the last five years. Most growing media used in soilless culture are so called bio-growing media which are made of compost with crop residue. Seldom professional peat-based growing media can be found in soilless culture because the price of imported *Sphagnum* peat is too high and domestic fen peat does not have the needed characteristics.

The total area of soilless culture is not more than 10,000 ha in China at present. Because China is a country with a huge population and land shortage, soilless culture should be extended quickly in near future because of its superiority of land saving, application of new technology and high productivity. If the total area of soilless culture was the same as in Europe, the consumption of growing media in soilless culture would reach 14.25 million cubic meters a year.

Chinese families which live in cities have no real home garden but people grow flowers and green plants indoors. As the quality of living and public awareness of food safety increase, more and more peoples start to home-

grow their own vegetables on balconies and on roofs of buildings. Now there are 430 million families living in Chinese cities. It is estimated that in future these families will consume 5 million cubic meters of growing media a year.

The Demand for Peat-Based Soil Improvers

Degradation, fertilization failures and pollution of agricultural soils are serious problems in China. Food safety is highly challenged. The restoration of degraded and polluted soil is urgent and demands for soil improvement is massive. Attention must be paid to greenhouse soils because relinquishment of crop rotation will cause serious soil compaction, an unbalanced soil nutrient status, soil acidification, soil salinization and accumulation of soil-borne pathogens, pests and weeds. Greenhouses are the main production sites of vegetable and fruits for the Chinese urban population and can make 40-60 thousand Chinese Yuan per ha and year. That is why greenhouse soils are seen as the target market for peat-based soil improvers, although peat is also very efficient in improving arid, saline and sandy soils.

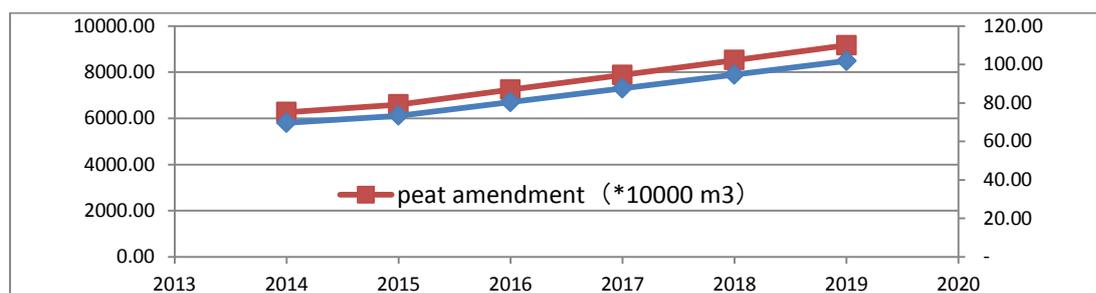


Figure 1: The growth of greenhouse area and demand of soil amendment

In China in 2014 greenhouses covered a total area of 700 thousand ha. By 2019 the total area will be 1.04 million ha. . The amount of soil improvers will increase from 62.6 million cubic meters to 91.6 million cubic meters. Even though compost and organic fertilizer can be used for greenhouse soil improvement, peat-based soil improvers will dominate the market due to their advantageous physical, chemical and biological properties.

Demand for Functional Fertilizer for Peat

Peat-based fertilizers not only supply nutrients but are also effective in dry soil conditions, as diluents of stressed soils and can balance the nutritional status of soils. Peat-based fertilizers can be manufactured as organic-inorganic complex fertilizers, liquid fertilizers, suspension fertilizers and microbiological fertilizers. The total peat demand for the manufacture of peat-based fertilizer is estimated to be about 72.4 million cubic meters.

Table 2: Peat Demand for the manufacture of peat-based fertilizer

Product	Organic fertilizer	Liquid fertilizer	Suspension fertilizer	Microbiological fertilizer
Composition	Peat powder + manure	Fulve acid	Peat powder + inorganic fertilizer	Peat powder + microbial agents
Form	Solid powder	liquid	Suspension slurry	Solid powder
Process	Manure is absorbed by peat then fermented, dried and packaged	Fulve acid is extracted then mixed with macro-, meso-, micro nutrients	Ultrafine grinding of peat, then mixed with fertilizer.	After grinding then spread and absorb micro-agents
Price ¥/ton	600-1,000	30,000-50,000	600-1,000	1,000
Application	Cultivation of organic vegetable and fruit	Vegetables, fruits and grain	Greenhouse	Greenhouse and field farmland
Effect	Increased output, improved quality	Increased output, Improved quality, improved resilience	Increased output, Improved quality, Improved resilience	Improved soil conditions , Better plant growth, reduced disease risk
Market demand	20,00 million tons	1,000 tons	1.20 million tons	10million tons
Peat demand	40.00 million cubic meter	25 thousand cubic meters	2.40 million cubic meters	30million cubic meters

Total Demand for Peat in China

The estimated potential total demand for peat in China is 253.7 million cubic meters per year. The output value of the peat industry is estimated to be about ¥132.6 billion.

Table 3: The total potential demand of peat resource in China

Peat use	Demand (million m ³)	Price (¥/m ³)	Output value (Billion ¥)
Growing media for seedling	45.91	500	22.95
Growing media for soilless culture	14.25	600	8.5
Home garden	5.00	800	4.0
Vertical greening	1.00	600	0.6
Soil amendment	110.00	500	55.0
Functional fertilizer	72.40	500	36.2
Medicine	1.00	38,000	3.8
Energy	5.04	300	1.5
Total	253.70	Total	132.6

DISCUSSION

China's economy is shifting from quantity to quality growth, the government's strategic policy is: innovation, green, open, sharing and coordination. Therefore China ushered in a new era for the peat industry which is a rare and excellent opportunity for all involved. The more applications of peat, the faster peat demand growth of China will be. The overall peat demand is expected to climb up to 10-20 million cubic meters with a growth rate of 20% in the next five years

With this scale of expansion of peat use, peat processing technology and equipment, the demand for peat will grow rapidly. Especially the manufacture technology and processing equipment for growing media, soil improvers, peat-based fertilizers and, application techniques for all peat-based products will receive worldwide attention.

CONCLUSION

The next 10 years will be a rapid growing era of the peat industry in China. This does not only present development opportunities within the Chinese peat industry, but also for the worldwide peat industry. China will openly receive the required quality resources from throughout the world ensuring lowest custom tax and powerful promotion of peat applications. Any entrance of peat resources and interested companies is welcome. As China lacks indigenous resources of woody peat with high contents of humic acids and weakly decomposed *Sphagnum* peat for horticultural applications, imports from

Europe, America and Russia will be the resource strategy that China will engage in. Imported peat will be the predominant constituent of peat products in China, supplemented by domestic fen peat. The main target of the Chinese peat industry is modernization, standardization and value-added peat processing.

ACKNOWLEDGEMENTS AND REFERENCES

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