

Research on Agricultural Pollution Problems and Prevention Measures in Guangxi Wuxuan County

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Abstract

With the continuous advancement of agricultural modernization and rural revitalization, the problem of agricultural pollution has become increasingly prominent. Strengthening the control of agricultural pollution to make agriculture sustainable development, affects the development and destiny of a country's agriculture. By investigating the actual situation of agricultural pollution in Wuxuan County, Guangxi, the main problems of local agricultural pollution are put forward, in view of the existing problems, countermeasures and suggestions are put forward, such as improving the protection awareness of practitioners, improving infrastructure construction, accelerating agricultural transformation and upgrading, and strengthening top-level design.

Keywords: Wuxuan County, agricultural pollution, sustainable development, prevention and control measures

1. Introduction

Wuxuan County, located in the central part of Guangxi and on the Tropic of Cancer, covers an area of 1,739.45 square kilometers. It has jurisdiction over 9 towns, 1 township, 142 village committees, and 8 communities, with a total population of 458,600. It is China's sugar base county and commodity grain base county.

In recent years, the agricultural development of Wuxuan County, Guangxi has been good. With the strong support and guidance of the local government, the agricultural production value has grown steadily, the breeding environment has been continuously improved, and the degree of mechanization and technical level of agricultural production has been further improved, reaching 67.42%, accumulated 1.1796 million acres of crops have been planted, including 406,600 acre of arable land for grain planting. So far, the county has built a total of 203,000 acre of "double-high" sugar cane bases. With the continuous improvement of agricultural production level, agricultural production has also increased the input and use of chemical fertilizers, pesticides and plastic films, but the consequent agricultural pollution has made the sustainable development of local agriculture face huge challenges. According to statistics, in Wuxuan County, the actual amount of chemical fertilizer input for two seasons of rice and corn in Wuxuan County is 80 kg/acre, the total nutrient input is 30 kg/acre, the average amount of pesticides is 19,000 tons, and the average amount of pesticides per unit of arable land is 1.5 kg/acre, 2900 tons of protective film is used every year, exceeds international standards. Irregular fertilization, pesticide spraying, use of plastic film, and discharge of livestock manure in the production process have led to further deterioration of farmland and groundwater, affected soil and drinking water, and faced enormous challenges to rural ecology and water safety for the masses.

Through the analysis of the specific agricultural pollution in Wuxuan County, this paper puts forward suggestions for the prevention and control of agricultural pollution.

2. The Main Problem of Agricultural Pollution

2.1 No Standardized Use of Fertilizers, Pesticides and Mulch

With the continuous improvement of agricultural production levels, agricultural production has also increased the use of chemical fertilizers, pesticides and plastic films. According to an article published by the American technology blog Quartz in the Global Times, 1/5 of China's land is currently polluted, of which arable land It accounts for 20%, and due to the extensive use of nitrogen fertilizer, the pH value of some soils has dropped to 3 (severely acidic), which is no longer suitable for the growth of any crops. Although the soil quality situation in Wuxuan County is far less serious, the existing problems should not be underestimated. One is the excessive use

of chemical fertilizers and pesticides. According to statistics, in Wuxuan County, the amount of chemical fertilizer input in two seasons of rice and corn is 80 kg/acre, and the total nutrient input is 30 kg/acre. Both the physical amount of chemical fertilizer per acre and the total nutrient input are more than developed countries. A safe upper limit of 15 kg/acre for soil and water contamination by fertilizers. The national standard stipulates that the reasonable ratio of nitrogen, phosphorus and potassium for fertilizer application is 1:0.5:0.5, while the current average ratio in Wuxuan County is 1:0.45:0.25, and the proportion of nitrogen fertilizer is obviously high. The average annual pesticide usage in Wuxuan County is 19,000 tons, and the average annual pesticide usage per unit of arable land is 1.5 kg/acre, of which 55% are pesticides, 21% are fungicides, 22% are herbicides, and 2% are other pesticides. Because the dosage of pesticides is too large and the formulations are not matched, the formulations such as emulsifiable concentrate and wettable powder account for more than 55%, resulting in excessive pesticide residues in agricultural products, increased arable soil toxicity, and complex air and water pollution. The second is the extensive use of mulch. Due to the obvious effect of mulching film in increasing production, farmers often use cheap mulch film with low price, thin thickness, poor strength and easy damage for economic benefits. According to statistics, the annual use of mulch film in Wuxuan County is 2,900 tons, and the annual residual amount is about 500 tons, accounting for more than 17% of the use of mulch film. Inexpensive plastic film is difficult to degrade and is not easy to recycle. The debris remains in the soil, destroying the structure of the plough layer, affecting soil ventilation and water and fertilizer conduction, causing pollution to the soil and detrimental to the growth of crops, making the sustainable development of local agriculture facing huge challenges. Irregular fertilization, pesticide spraying, use of plastic film, and discharge of livestock manure in the agricultural production process have led to further deterioration of farmland and groundwater, affecting both soil and drinking water, and the rural ecology and public water safety are facing huge challenges.

2.2 The Degree of Resource Utilization of Livestock and Poultry Breeding Wastewater and Straw Is not High

At present, there are 493 livestock and poultry farms in Wuxuan County with annual production of more than 100 pigs, and a considerable part of them are in prohibited or restricted areas. Preliminary treatment of precipitation, but only 17 large-scale farms have actually carried out in-depth treatment. Most of the farms have no enthusiasm for deep pollution treatment in order to save money. In addition, there are 3,869 free-range farmers in the city. Most of them operate on a small scale, with poor breeding facilities and primitive treatment of livestock and poultry manure and pollutants, which seriously pollutes the environment.

The sewage of the farm is mainly composed of urine, feces and washing wastewater, which are all low-concentration organic sewage, and the content of suspended solids and ammonia nitrogen in the pool can easily lead to eutrophication of the water body. If untreated sewage enters natural water, the water may contain a certain amount of suspended solids, organic matter and microorganisms, which change the structure and composition of the physical, chemical and other biological communities of the water body, and seriously deteriorate the water quality. The aquaculture sewage may also contain many pathogenic microorganisms, which are easily spread through drinking sewage water or other aquatic animals and plants, endangering the health of humans and other animals. In addition, high-concentration aquaculture sewage will directly block the pores of the soil, which will reduce the permeability and water permeability of the soil and cause hardening and salinization deformation, thus greatly reducing the quality of the soil and causing serious damage to crops.

The total amount of various crop straws in Wuxuan County is about 700,000 tons throughout the year, including 500,000 tons of sugarcane straw, accounting for more than 70%; 140,000 tons of corn straw, accounting for 20%; and 60,000 tons of other crop straws. About 20% of these crop straws are used as fertilizers, 25% are used as feed, 25% are used as fuel, 3-4% are used as industrial raw materials, and the remaining 25% are unused, and most of the unused straws are dumped in rivers and ditches, they will be mildewed by wind and sun, blisters and rain, and polluted water and soil through surface runoff and soil leakage. Especially during the harvest and planting periods in summer and autumn, some farmers burn straws in the fields to save trouble. The smoke and dust are everywhere, covering the sky and the sun, producing a large amount of carbon dioxide and seriously polluting the air.

2.3 Insufficient Attention from Local Government Departments and no Scientific Prevention and Control System

First, insufficient regulation. Rural pollution prevention and control forces are not concentrated enough, sewage discharge and water control capabilities are low, and pollution coverage is relatively wide; the source of agricultural pollutants has not been strictly controlled, due to the special living environment of farmers, the living environment is relatively scattered, it is difficult to manage in a unified way, which brings certain restrictions and obstacles to the prevention and control of agricultural pollution. The legal system related to rural environmental sanitation protection is imperfect and unclear, and the operator's concept of agricultural pollution prevention and control is relatively weak; the planning scope is broad but not detailed, the theory far exceeds the practice, and its

operability is not strong in general; the rural environment There is no standard for sanitation, and the township government has failed to formulate detailed rules for the prevention and control of agricultural pollution in light of local conditions.

Second, lack of dissemination of information and knowledge. Farmers have limited awareness of agricultural pollution, and a lot of knowledge about agricultural pollution needs to be popularized by relevant departments. However, due to the single way of publicity, it does not carry out popular science based on the actual situation and preferences of farmers, resulting in poor publicity effect; the publicity of agricultural pollution is simple. The responsibility of the propaganda department has not achieved the desired effect. How to unite all relevant departments to carry out joint and divided propaganda is the top priority.

Third, joint prevention and control. The work of agricultural pollution control mainly involves several departments, such as the Agriculture and Rural Affairs Bureau, the Agricultural Extension Station, the Propaganda Department, the Natural Resources Bureau, the Environmental Protection Bureau, etc. Although agricultural pollution seems to be a department with supervision and guidance, due to the work coordination mechanism is not perfect, the responsibilities and authorities of each department are not clear enough, and the cooperation between them is not smooth enough, so that the prevention and control of agricultural pollution has not formed a synergy, which affects the efficiency and quality of work.

Fourth, insufficient capital investment. For a long time, government departments have invested limited financial funds in urban pollution prevention and environmental beautification, while the investment in agricultural pollution control is seriously insufficient. On the one hand, due to the characteristics of my country's agricultural pollution that are scattered, hidden, random, difficult to monitor, difficult to quantify, and widely distributed, and the local and national financial departments have not invested enough in the pre-control and prevention of agricultural soil and non-point source pollution, directly has led to the deterioration of agricultural pollution; on the other hand, due to the incomplete facilities and equipment such as sewage treatment and agricultural production waste recycling, practitioners have not found suitable treatment methods, and the discharge of sewage and the placement of waste are relatively random, which makes supervision more difficult to manage.

At last, the influence of topography. Due to the complex geographical and topographical environment in Wuxuan County, the central, western and southern parts of the county have different illumination, airflow and precipitation due to the influence of mountains, and the soil quality and topography are very different. The differences in climate caused by complex and diverse topography make it more difficult to control agricultural pollution.

3. Advice

3.1 Strengthen Supervision and Formulate Effective Systems

Effectively strengthen the environmental sanitation management of pesticides, chemical fertilizers, straw, agricultural film, livestock farm sewage, etc., and formulate and strictly implement limited agricultural production technical standards in key water source protection areas and river basins. Do a good job in recycling agricultural wastes such as plastic film, fertilizer packaging, and pesticide packaging, formulate corresponding recycling and disposal implementation methods, and strengthen publicity, guidance, and supervision and management. Large-scale livestock and poultry farms fully implement pollution discharge permits, and at the same time formulate detailed pollution discharge rules and standards for backyard farmers.

Explore and speed up the establishment of a management mechanism for agricultural waste recycling, storage and disposal that "takes townships and towns as the main body of responsibility, relevant departments coordinate and supervise, business units are discounted and recycled, agricultural materials enterprises are centrally stored and transported, and professional environmental sanitation units are collected and destroyed." A large number of pesticide packaging garbage and a large number of discarded pesticide packaging products are piled up and abused randomly. Town, village, and social service workers divide service functions and responsibility areas in accordance with the work requirements of clarifying service areas and grids, effectively standardize service management, and clarify the responsibilities of various subjects.

According to national standards, combined with local topography and landforms, the rules for the use of fertilizers, pesticides, mulch, etc. are formulated, and farmers are encouraged to go to regular manufacturers and institutions to buy fertilizers, pesticides and mulch according to their own needs, and try to use domestic and local well-known brands. At the same time, strengthen the supervision of agricultural products, prevent false advertising to mislead farmers to buy, and crack down on exaggerated and false effects of agricultural products. Increase the inspection and guidance of the recycling work of each recycling point and each township, according to the principle of who is responsible for sales and territorial management, strengthen follow-up supervision to ensure the smooth

development of recycling work.

3.2 Increase Publicity Efforts to Enhance Practitioners' Awareness of Protection

Strengthen publicity and education, focusing on business training for pesticide producers and operators, popularize policies and operating procedures for the recycling of pesticide waste packaging, ensure the standardized implementation of recycling, and increase publicity and guidance to the whole society to enhance the initiative and enthusiasm of recycling work. Through a series of flexible, rich, diverse and well-liked publicity and education activities, let the local people and the masses realize the impact and harm of agricultural environmental pollution, especially to further increase the publicity for farm managers and family operators to improve The awareness of environmental pollution to the person in charge of the farm and the family operator; to organize the professional and technical personnel of the agricultural technology station in the town to enter the village, go to the field and land, and widely publicize the impact of agricultural pollution on the rural living environment and the harm to the human body, and guide the public. People have high levels of agricultural pollution and prevention and control to ensure the sustainable development of local agriculture; the staff of the Agricultural and Rural Comprehensive Service Center widely publicize the waste plastic film, straw burning, chaos, etc. The impact and harm of throwing agricultural packaging on the agricultural environment will increase the public's awareness and awareness of preventing agricultural pollution.

3.3 Increase Capital Investment and Improve Infrastructure Construction

Increase capital investment to promote prevention and control. Improve infrastructure construction, build and improve the agricultural pollution detection system, and ensure that agricultural pollution is effectively controlled. Include funds for the recycling and disposal of agricultural wastes such as plastic film, fertilizer packaging, and pesticide packaging into the financial budget. County Development and Reform Commission, Ministry of Finance and other relevant departments should delineate the division of labor and job responsibilities according to their functions, increase policy support for agricultural non-point source pollution control, give key support in project establishment, capital investment and other aspects to ensure the integrity of the agricultural pollution control mechanism. Long-term operation. The government can properly consider the introduction of market mechanisms, use the leverage of the market to further improve the efficiency of capital utilization, establish an ecological compensation mechanism, and encourage farmers to participate in agricultural pollution prevention and control as masters. Actively promote the recycling of corn stalks and waste plastic film, set up garbage sorting and recycling stations and waste plastic film recycling service outlets in villages and villages, increase subsidies, and improve the utilization rate of straw recycling. Further improve the comprehensive utilization efficiency of straw, promote the green ecological development of agriculture, increase the income of local farmers, vigorously popularize the efficient utilization technology of crop straw, improve the comprehensive utilization ability of crop straw, and control the burning and random disposal of straw.

In order to ensure that the investment in agricultural pollution prevention and control achieves tangible results, it is necessary to select an agricultural pollution prevention and control technology and technology that is in line with local conditions and markets, adopt a diversified agricultural pollution prevention and control model, and pay attention to whether the goal of environmental pollution prevention and control investment is To be able to maintain persistence and coherence, further increase capital investment in facility construction, improve facility operation and management capabilities, strengthen investment in the introduction and training of technical personnel, and ensure that the established environmental sanitation facilities can operate stably and continue to play a role. Its role, effectively improve the ability to prevent and control environmental pollution.

3.4 Increase the Promotion of Advanced Agricultural Technologies and farming methods, and Promote Agricultural Transformation and Upgrading

Agricultural and rural bureaus and agricultural extension stations in townships should strengthen agricultural science and technology service guidance and new technology promotion. Extensively carry out training and promotion of new modern agricultural production technology, focus on the implementation of soil testing and formula fertilization technology, use advanced microbial pesticides or pesticides with high efficiency, low toxicity and no residue, and promote the resource utilization of straw and livestock and poultry manure and other technologies. "Promote prohibition by use", promote some relatively mature comprehensive utilization technologies of straw and livestock and poultry manure to rural areas, gradually realize the integration of planting and breeding, and solve the problem of agricultural non-point source pollution from the root. For example, the development of straw recycling and comprehensive utilization should support the full implementation of the comprehensive utilization of straw bio-fertilizer industrialization, vigorously encourage and support the development of the comprehensive utilization of straw bio-feed industrialization, continue to promote the

comprehensive utilization of straw for bio-energy, and support the recycling and replacement of straws. Incinerate, cultivate and encourage the development of comprehensive utilization of straw bio-materials. The local area can also try to return the accumulated fertilizer to the field for treatment, using the effectively treated livestock and poultry manure and urine sewage to irrigate the farmland, and using the purification capacity of the farmland crops and soil to achieve the purpose of decontamination and fertilizer absorption. Large-scale farming can try to promote the breeding model of "pig, swamp, and fruit". Through the circulation of material and energy flow, it can not only protect the ecological environment from damage, but also obtain higher economic benefits.

When planting agricultural products, crop rotation can be used for planting, such as planting soybeans in the first year and planting corn in the second year. Or through the second year of land cultivation, the microbial population in the soil can be restored, and the frequency of use of pesticides and fertilizers can be reduced.

3.5 Strengthen Top-Level Design and Increase Joint Prevention and Control Efforts

The county party committee has unified organization and leadership, and all relevant departments attach great importance to agricultural pollution prevention and control, coordinate and assist in vigorously promoting agricultural pollution prevention and control, and further strengthen the organization and leadership of the party committee and clarify the division of responsibilities in specific work; strengthen planning guidance, strengthen science and technology Support; strengthen publicity and popularization, and do a good job in source governance; increase capital investment to improve prevention and control capabilities; strengthen supervision and standardize pollution prevention and control. Promote the joint agricultural pollution prevention and control of the Bureau of Agriculture and Rural Affairs, the Bureau of Agriculture and Animal Husbandry, the Bureau of Finance, the Propaganda Department, the Administration for Market Supervision, the Bureau of Water Affairs, the Bureau of Forestry and Grassland, the Bureau of Natural Resources Conservation, and the Bureau of Ecology and Environment. Compared with supervision, the cost of environmental protection education is much lower. The county party committee should promote the popularization of agricultural pollution prevention and control, and divide the popularization of agricultural pollution prevention into relevant departments. work to reduce the use of pesticides and fertilizers.

It is necessary to implement the main responsibility, strengthen the monitoring of the compulsory punishment system, establish and improve the self-monitoring, supervision, management and other systems, and list the comprehensive management of agricultural pollution as an assessment item for the work of various departments in the county and townships. Regularly and irregularly organize and implement agricultural pollution prevention and control inspections in rural areas, commend and reward departments and units that have done their best work and have achieved remarkable results, and give notices of criticism to those who do not perform well, and hold them accountable in accordance with the law.

4. Conclusion

Rural revitalization and the sustainable development of agriculture are inseparable from the participation of the masses and the guidance of government departments. Only by mobilizing grass-roots mass organizations, actively guiding and strictly supervised by administrative departments, and establishing a scientific agricultural pollution prevention and control system, can guarantees be ensured. Only when farmland, ecology and drinking water are safe can rural industries be prosperous, ecologically livable, civilized, effective governance, and a prosperous life.

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