

Integration of agrochemical service in Europe

Bujnovsky R. Fertilization with regard to subsoil, p. 5

Abstract

The nutrient content of the subsoil represents an interesting nutrient pool from the view-point of plant requirements. Exploitation of this pool requires the presence of a root system that is able to adsorb nutrients, especially inorganic nitrogen, available potassium and magnesium. The following soil parameters were used; soil depth, salt content, soil texture and slope. These are the characteristics of the main soil units (0 to 99) within the system of soil ecological units. Shallow soils up to 0.3 m, saline soil types, soil on excessive slopes (over 17°) and very heavy soils were excluded from the set of suitable soils. A system using a seven-digit code for the soil ecological units may be incorporated into a software algorithm for calculation of nutrient rates. This enables the precise selection of soil types according categories of skeleton content (over 25 %) and slope, as well as, categories of soil texture. Rooting depth as well as root density are important parameters for the selection of crops that are able to take up nutrients from the subsoil. Crops were selected using information available in the literature. In the case of inorganic nitrogen it is possible to directly update its content in the topsoil by that measured in the subsoil (usually in layer 0 to 0.6 m) taking into account the skeleton content. This is especially valid with nitrogen rates which occur in the spring period. In the case of potassium an indirect way of topsoil-K updating must be used, because the available K-content, as well as, other correction parameters (root system distribution or density, PBC^K and others) are not available.

Key words: subsoil, available nitrogen, available potassium.

Cermak P., Mezulianik M. Soil testing in the Czech Republic, p. 14

Abstract

In the paper all components of the soil testing system, i.e. methods of soil analysis, calibration figures and the development of soil fertility status in Czech Republic are presented. The consumption of mineral fertilizers has decreased dramatically after 1990 which is already reflected in the soil acidity and the content of available nutrients data.

Key words: soil fertility, soil pH, available nutrients, fertilizers consumption

Cermak P., Travník K. The optimization of nitrogen fertilization of winter wheat according to the results of soil and plant analysis, p. 22

Abstract

In the paper the results of three-years experiments with nitrogen fertilization of winter wheat are presented. In 6 treatments different strategies of estimation of nitrogen rates were included. The best result offers IAP method based on plant analysis and then N - tester method based on direct measurement of chlorophyll content in the leaves. Securing the same yield level, the diagnostic methods made possible considerably reducing of nitrogen rates.

Key words: plant analysis, soil analysis, winter wheat, N-tester

Fotyma M., Kopinski J. Nutrient use in selected European Countries, p. 35

Abstract

The common, indirect procedure for measuring nutrient losses from agriculture is to calculate nutrient balances. The most recommended methods for nutrient budgeting are soil surface balance (according to OEC) and farm gate balance (according to PARCOM). Both methods were employed by the East and Middle - European countries co-operating in scope of unification of agrochemical services. Farm gate balance calculated for Germany and Poland showed the surplus of all nutrients though the surpluses were by 40-50 % lower in the last mentioned country. Soil surface nitrogen balance for the late nineties was positive for all countries, except Hungary. The balance of phosphorus, but for Hungary, was almost at equilibrium while the balance of potassium showed deficits in all countries except Germany. In some way conflicting results for Hungary can be explained by modification of the calculation method recommended by OECD. The surpluses of all nutrients strongly diminished or even turned to negative in the period of time between late eighties and late nineties.

Key words: soil surface nutrient balance, farm gate nutrient balance, nitrogen, phosphorus, potassium

Janssen E. Grenzwerte für Schwermetalle und organische Schadstoffe in Boden, p. 44

Zusammenfassung

Für Boden gibt es in Europa zahlreiche Regelungen und entsprechende Vorschriften. Eine Vereinheitlichung zu einem europaweit gültigen Regelwerk ist momentan aufgrund der sehr unterschiedlichen Ausgangslage schon allein bei der Datengrundlage nicht möglich. Eine Richtlinie für entsprechende Regelungen auch den Boden betreffend für die Aufbringung von Klarschlamm auf landwirtschaftliche Flächen ist in Vorbereitung. In der Bundesrepublik Deutschland ist seit dem 1. März 1999 das Gesetz zum Schutze des Bodens und seit dem 12. Juli 1999 eine entsprechende Verordnung mit weitergehenden Regelungen in Kraft. Im Gesetz sind die Funktionen des Bodens und die entsprechenden Schutzziele formuliert, die gleichlaufend sind mit den Zielen der europäischen Bodenschutzpolitik. Ein dreistufiges System ist beschrieben, wie die Situation einer Fläche erfasst und bewertet werden kann. Für die einzelnen Stufen (Vorsorge, Prüfung, Maßnahmen) sind Grenzwerte festgelegt. Auch die entsprechenden Untersuchungsmethoden für Schadstoffe sind genannt. Da das System der Grenzwertfestlegung unbefriedigend in seiner Wirksamkeit bezüglich seiner Nachhaltigkeit ist, wird in der Bundesrepublik ein Verfahren diskutiert und erarbeitet, das sich auf regionale Hintergrundwerte stützt und die Forderung der Vermeidung von schädlichen Bodenveränderungen auf diesen Wert bezieht.

Stichworte: Bodenschutz, Grenzwerte von Schadstoffen, Klarschlammrichtlinie, Hintergrundwerte

Kotvas F. Agrochemische Bodenuntersuchung in der Slowakei, ihre Entwicklung und gegenwärtige Lage, p.60

Loch Jak. Die Bedeutung der Düngung und Bodenuntersuchung in der Bewahrung der Bodenfruchtbarkeit, p. 66

Zusammenfassung

Die Durchsetzung des umweltgerechten Landbaus in Mitteleuropa ist ein agrarpolitisches Ziel. Zu den wichtigsten Kriterien der nachhaltigen Wirtschaftsweise gehört die Erhaltung der Bodenfruchtbarkeit. Der gegenwärtige Düngeraufwand in Ungarn liegt weit unter dem Niveau das in den westeuropäischen Ländern durch speziell geförderte Extensivierungsprogramme

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angestrebt wird. Das widerspricht dem Nachhaltigkeitsgrundsatz ebenso, wie dem Effizienzgebot bei der Ressourcenverwendung. Zwischen Nährstoffversorgung und Erträge bestehen in Ungarn auf Landesebene enge Beziehungen. Der Rückgang des Düngemittelverbrauches nach 1990 wirkte negativ auf die Produktion von Weizen und Mais. Die negative Nährstoffbilanz der letzten Jahre gefährdet die Fruchtbarkeit der Böden, der pflanzenverfügbare Nährstoffgehalt der Böden ist nachweisbar gesunken. Die günstigen ökologischen Verhältnisse der landwirtschaftlichen Produktion in Ungarn sollen weiterhin genutzt werden. Die Düngung soll mit minimaler Belastung der Umwelt durchgeführt werden. Die Ziele der Produktion und des Umweltschutzes können mit standortgerechter Bewirtschaftung in Einklang gebracht werden. Die Düngergaben müssen standortspezifisch, das heißt mit weitgehender Berücksichtigung der Verhältnisse, differenziert bemessen werden. Die regelmäßige Bodenuntersuchung ist sowohl unter dem Gesichtspunkt der Produktion als auch des Umweltschutzes unentbehrlich. Eine an die ökologischen Verhältnisse angepaßte, umweltgerechte Düngung kann nur auf die systematische Kontrolle der Böden aufgebaut werden.

Kennworte: Bodenfruchtbarkeit, Düngung, Bodenuntersuchung, umweltgerechter Landbau

Palmei O. Information on the function and the structure of the Hungarian plant protection and soil conservation organization, p. 74

Abstract

The Plant Protection network in Hungary was founded in the second half of the 1950' s. In each of the counties a station was established by the state to organise and manage pest-control. As there are 19 counties in Hungary plus the capital has the rights of a county, we have got altogether 20 stations. Since 1976, the different organisations for plant protection and soil conservation in Hungary have been merged into one overall institution which follows the administration structure of the country. It is not common to combine the activity of the plant protection and the soil conservation in one legislative entity and also in one technical organisation. However, it is logical that the clean environment, the safe plant nutrition, the safe crop protection and the safe and healthy agricultural products are closely bound up with each other. The national system of institutions is directed and supervised by the Department of

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Plant Protection and Agro- Environment Management in the Ministry of Agriculture and Regional Development.

Puchwein G. Organisation der agrochemischen Forschung und Untersuchungen in Österreich, p. 77

Zusammenfassung

In Österreich verfügt das Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft über zahlreiche, in verschiedenen Orten des Landes angesiedelte Forschungs- und Untersuchungseinrichtungen mit agrochemischen Laboratorien. Diese Aufgaben umfassen Forschungsbelange, staatliche Kontrollen besonders von Futtermitteln, Düngemitteln, Saatgut, Wein und Pflanzenschutzmitteln und Dienstleistungen für Landwirte und deren Organisationen. Fast 500 Personen arbeiten in diesen Einrichtungen auf analytischem Gebiet. Schwerpunkte der Untersuchungstätigkeiten betreffen Boden, Pflanzenmaterial, Düng- und Futtermittel, Wein, Milch und verschiedene Lebensmittel, die von den Labors produziert wurden, 32% auf Forschungsaufgaben und 42% Kontrolltätigkeiten entfielen.

Stichworte Österreich, landwirtschaftliche Labors, Tätigkeitsprofil 2000

Stana J. Agrochemische Dienstleistungen in der Tschechischen Republik, p. 86

Torma S. The relation between crop yield and consumption of mineral fertilizers in Slovakia over the last decade, p. 90

Abstract

The consumption of mineral fertilisers in Slovakia is nowadays 18-23% lower as compared to the 1989-1990 period. It means that during the last six years only 42-57 kg NPK was applied per hectare of farmland, whereas in 1989-90 the consumption rate was 240 kg NPK. Nitrogen fertilisers contribute to 66-71 % and phosphorus along with potassium - to 29-34% of the total amount. However the decrease of main crop yields (cereals, maize, oil plants, potatoes, sugar beet, annual and perennial fodder crops) was not parallel to the reduction of fertiliser consumption. The yield of cereals and fodder crops decreased by 10-30%, but at the same time

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the yield of potatoes, sugar beet and maize increased by 10%, 10-15% and 15-25%, respectively. This can be explained by relatively high rates of nitrogen fertilisers and by sufficient supply with phosphorus and potassium coming from the soil reserves.

Key words: mineral fertilisation, crop yields, soil nutrient supply

Wójcik P. Fruit production as influenced by nitrogen fertilization, p. 99

Abstract.

In this paper, problem of nitrogen management in orchards is presented. An understanding of the relationships between nitrogen and plant response is crucial in managing nitrogen in plant production. Inadequate plant nutrition of nitrogen has negative effect on growth, cropping, and fruit quality. Moreover, unsuitable nitrogen fertilization can affect negatively natural environment. Therefore, nitrogen fertilization should be applied based on soil test and analyses of plant tissues. However, in fruit production, soil test to estimate mineral nitrogen has not been used. Common index to evaluate nitrogen status of fruit trees is leaf analysis. The procedure of collecting leaf samples must be the same as that used in establishing the standards. Leaves of fruit trees should be collected 60 to 70 days after petal fall, from middle part of shoots, and from central zone of canopy. Standards used in interpreting results of leaf nitrogen analysis have to account for differences among varieties, stages of tree development, and fruit destination. Appearances of trees (vigor, thickness of shoots) and fruit (skin color, blush surface, storability) are also included in evaluating nitrogen fertilizer requirements. In orchards, nitrogen broadcasting over surface of herbicide strips along the tree row is the most frequently applied mode of nitrogen fertilization. Fertigation with nitrogen in orchards is the new mode of nitrogen fertilization and effect of this treatment on plant response is not well known. Foliar nitrogen application is supplementary treatment for soil application and it should be applied when small amounts of nitrogen are needed at critical stages of fruit trees. In the case of severe damage of tree root system, foliar nitrogen application can make even a substitute for soil application. Recommended rates of nitrogen in orchards are up to 100 kg ha¹ and are dependent on soil fertility, and age and tree vigor. Ammonium nitrate and urea are the most frequently applied nitrogen fertilizers in fruit production; although various other materials are also used to meet specific objectives. Ammonium nitrate and urea are recommended in sustainable fruit

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production since they are highly effective in in-creasing fruit yield and do not make the danger for the environment.

Key words: nitrogen fertilization, fruit trees