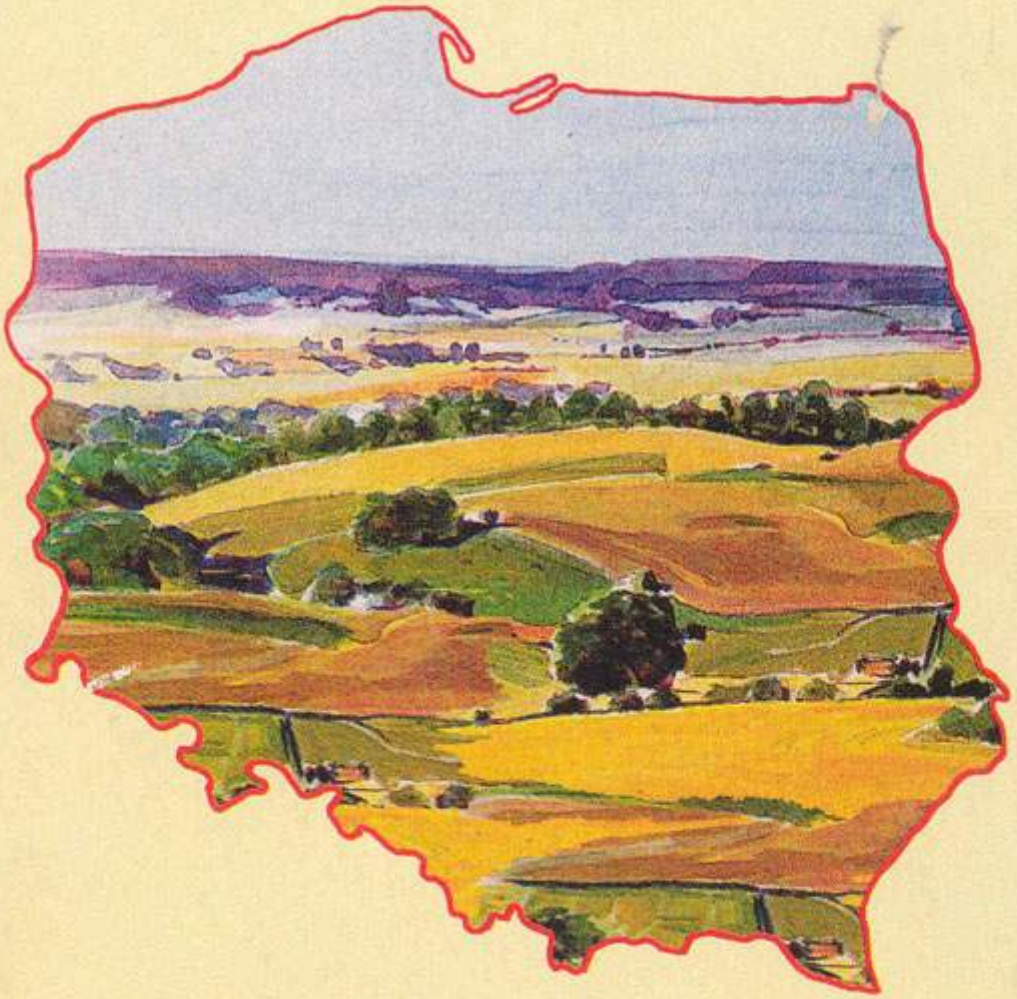
POLSKI KODEKS DOBREJ PRAKTYKI ROLNICZEJ

gleba woda powietrze



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Ministry of Agriculture
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Ministry of Environment

Code of Good Agricultural Practice

- 2001 -

Poland is often perceived abroad as a country of open space: vast plains interspersed with lakes, extensive meadows and woodland. This image has been sustained thanks to the natural heritage preservation efforts of the earlier generations of Polish farmers. It is thanks to their ways of farming land over many decades that we can now pride ourselves on the landscape they have passed on to us.

However, it is also us who need to expand our farming community's awareness on the environmental aspects of agriculture to ensure its environmentally sustainable development. Raising farmers' awareness on these matters and supporting their efforts to have the manure and animal waste collection and storage facilities installed on the farm holding is the responsibility of the Ministry of Agriculture because of the growing importance of the activities that ensure effective animal waste utilisation and management. Proper management practices bring twofold benefits as they prevent soil and water pollution on the one hand, and maximise the nitrogen content in organic fertilisers and the best effects if applied to the soil on the other.

"Code of good agricultural practice" presents practical guidance on how to minimise water pollution and what best practices can be applied on an individual farm to control it. The Code is to inform and instruct farmers on how they can enhance the landscape they live and work because their role is absolutely crucial to further development.
Therefore, the use of CGAP should be recommended to the entire farming community.

Jarosław Kalinowski

Being specific and unique element of the environment from the earliest days on, water has always been decisive factor to determine both, human life itself and its quality. Water resources in Poland comprising lakes, rivers and their water basins belong to our common heritage. They provide us with potable water, render the development of agriculture and industry possible as well as enable all of us to enjoy recreation activities. Thus, it is of utmost importance for us to protect our heritage and ensure that technological development and economic growth are of little negative impact to the quality of our waters.

Farmers have been traditionally assigned with the role of guardians protecting rural landscape and heritage. They understood the natural environment protection was very important quite a long time ago. They have always known that the environment protection is important not only for the sake of nature itself, but also because it is the only source to sustain life. However, the last few decades witnessed some significant changes in farming practices that have led to growing specialisation and intensity of agricultural activities. They, in turn, have led to some adverse effects on natural assets, including water, and, in broader sense, the entire environment.

As an attempt to fill in the information and educational gap, **"Code of good agricultural practice"** provides farmers with a collection of environmentally friendly agricultural practices. If applied, they will ensure sustainable growth of agricultural production. The major aim of CGAP is to upgrade the general awareness and basic knowledge on water protection as it is a major element of the natural environment, to be followed by the enhanced knowledge of how to better protect some other natural environment resources such as soil, air and landscape. We need to know what can be done to protect them better.

Handing over the CGAPP to readers I hope its use is going to be promoted widely by all the interested parties – local self-government authorities, agricultural organisations, academics and research workers and agricultural extension services as well as farmers communities nation-wide. We all need to act to sustain natural resources for our own sake.

Stanisław Żelichowski

Legislation on the agri-environment protection

A

Farm holding facilities and management in sustainable agriculture

- Management according to farm field structure
- Plant and animal production arrangements
- Balancing mineral and organic matter nutrients
- Integrated plant protection

B

Water protection

- Protecting water against point-source pollution
    - Manure pad and tanks to store organic fertilisers
    - Other solutions to protect water

- Protecting water against non-point source pollution

    - application timing and dosing for mineral and organic fertilisers
    - application of sewage and sewage sediment effluents
    - application of plant protection chemicals
    - agronomic methods to prevent water pollution

C

Protection of farmland

- Protection of soil against erosion and physical degradation
  - Erosion caused by water
  - Erosion caused by air
  - Air –water relations in soil on farmed land
  - Air –water relations in soil on grassland

- Protection of soil against chemical degradation
  - Soil reaction
  - Content of nutrients in assimilable form

- Protection of soil against biological degradation
  - Organic matter content in soil
  - Biological soil activity

D

Protecting air

- Air fogginess and dustiness
    - Odour substances
    - ammonia
    - greenhouse gases

E

Protecting landscape and maintaining biodiversity

- Farm holding in rural landscape
- Biodiversity in a farm holding

F

Rural areas infrastructure

G

Abridged set of good agricultural practice principles to implement the Nitrate Directive

H

Annexes

Annex 1

Soil organic matter reproduction and degradation coefficients

Crop or organic fertiliser	Unit	Soil reproduction (+) or degradation (-)			
		light	medium	Heavy	Humus-type soils
Root crops	1 ha	-1,26	-1,40	-1,54	-1,02
Maize/corn	1 ha	-1,12	-1,15	-1,22	-0,91
Cereals, oil-seed plants	1 ha	-0,49	-0,53	-0,56	-0,38
Legumes	1 ha	+0,32	+0,35	+0,38	+0,38
Turf grass	1 ha	+0,95	+1,05	+1,16	+1,16
Papilionaceous crops	1 ha	+1,89	+1,96	+2,10	+2,10
Manure	10 t	+0,70			
Slurry	10 t	+0,28			
Straw	10 t	+1,80			

Example (chapter B, item 20):

Crop rotation on light soil: potatoes 1 ha (25 tonnes of manure/ha) – maize 1 ha - oats 1 ha - rye 1 ha

Organic matter balance = l ha*(-1,26) + 25ton*(O,O7) + I ha*(-1,12) + 1 ha*(-O,49) + 1 ha*(-O,49) = -1,61

Warning! Organic matter balance is negative, crop rotation should be modified or new source of organic matter should be added (aftercrop, straw to be ploughed in).

Annex 2

Rates for farm livestock to be converted into Large Livestock Units (LLUs)
Regulation of the Minister of Environment, Natural Resources and Forestry of 14 July, 1998 (JoL, No 98 of 23 September, 1998)

Animal species and type	Age or weight	1 animal = 1 LLU
Fully grown horses	Weight over 500 kg	I ,2
Young horses	2-3 years, 1-2 years, 0,5-1year, up to 6 months	1,00; 0,80; 0,50; 0,30
Bulls	over 600 kg	1,40
Cows and heifers to be calved	over 2 years, weight about 500 kg	1,00
Heifers and young bulls	1-2 years, 6 to 12 months	0,80; 0,30
Calves	up to 12 months	0,15
Sows and boars	Sows with piglets	0,30
Fatteners	Heavy, bacon type	0,25; 0,20
Whiners	Up to 30 kg	0,10
Piglets	Up to 2 months	0,02
Rams	Over 18 months	0,12
Ewes heavy with lambs or milk ewes	Over 18 months	0,10
Young sheep	Young rams and ewes	0, l 0; 0,08
Lambs	6-12 months	0,05

Example (chapter C, item 10):

A farm holding with 15 hectares of farmland has livestock including cattle and pigs.

Cattle herd (closed cycle) includes: 10 cows, 5 calves up to 6 months, 5 heifers and young bulls 6-12 months, 5 heifers and young bulls 1-2 years. Pigs: (piglets have been bought): 20 whiners up to 30 kg, 20 pigs fattened for bacon.

Livestock density in LLU: = 10 cows *(I,00) + 5 calves*(0,15) + 5 young cattle 6-12 months *(0,30) + 5 young cattle 1-2 years* (0,80) + 20 whiners* (0,10) + 20 pigs fattened for bacon* (0,20) = 20,25

Annex 3

Organic fertiliser and nutrients amount from 1 animal per year.

Animal species and type	Manure				Slurry			
	Weight in tonnes	Nitrogen in kg	Phosphorus in kg	Potassium in kg	Weight in tonnes	Nitrogen in kg	Phosphorus in kg	Potassium in kg
Cattle								
Calves 0-6 months	2,6	20,8	5,2	15,6	-	-	-	-
Young bovine animals, 6-12 months	2,9	15,4	8,1	19,1	7,0	23,1	7,7	29,4
Young bovine animals 12-24 months	4,8	25,0	15,4	31,2	12,1	42,3	15,7	58,1
Cows - 4000 1mleka	12,0	66,0	38,3	64,8	23,2	97,4	39,4	107,0
Pigs								
Sow with piglets	4,0	20,0	24,4	18,8	8,3	25,4	26,6	20,7
Whiners up to do 30 kg	0,6	3,6	3,4	2,7	1,2	5,4	3,8	3,1
Fatteners 30-110 kg	1,2	7,2	6,9	5,4	2,4	10,8	7,5	6,3
Sheep	1,5	1,1	0,6	1,8	-	-	-	-
Horses	2,8	23,8	12,9	33,9	-	-	-	-

* kept indoors all the year round

Example (chapter C, items l; 7):
The farm is the same as in Annex 2, all the animals kept indoors according to manure system.
Amount of manure = 10 cows*(12,0) + 5 calves*(2,6) + 5 young bovine animals*(2,9) + 10 young bovine animals*(4,8) + 20 whiners*(0,6) + 40 fatteners*(1,2) = 155 tonnes of manure = 155*1,1 = 170 m3 manure in a year.

Annex 4

Average amount of nitrogen – nitrate ($N\text{-}NO_3$) in soil in autumn

Soil layer	$N\text{-}NO_3$ content in soil in kg/ha			
	Very light	light	medium	Heavy
0-30 cm	28	33	37	37
30-60 cm	15	18	20	20
60-90 cm	10	12	14	14
0-90 cm	53	63	71	71

Example (chapter C, item 65):

Farm holding is located on light soil with water capacity of 70+70+70 = 210 mm in the 0-90 cm layer; wintertime precipitation totals 140 mm.

The rainfall can move during wintertime up to 60 cm deep in soil (70 + 70 mm) and nitrates from the soil layer of 60-90 cm and 30-60 cm are going to leach into the ground water. Out of the total quantity 12 + 18 = 30 kg of the nitrogen leaching, half of the nitrogen will be lost (denitrification), and half of it will enter ground water. Thus, having added 140 mm rainfall (1400000 litres or kg / ha), 15 kg $N\text{-}NO_3$ per ha will enter ground water, which equals 15000000 mg/ 1400000 kg = 10 mg $N\text{-}NO_3$ in 1 litre (after rounding).

Warning: it is upper limit of nitrate nitrogen in drinking water there is a risk o nitrate pollution and the farm holding in question should apply prevention measures, for e.g. grow cover or winter crops (green fields).

Annex 5

Nutrients intake by some plants per one yield unit

Group of plants or a plant	Kg per100 kg (1 dt) major crop + side crop			Kg per 100 kg (l dt) side crop		
	Nitrogen	Phosphorus	Potassium	Nitrogen	Phosphorus	Potassium
Cereals and similar crops (seeds)						
Winter wheat	2,37	0,98	1,51	0,52	0,18	1,20
Rye	2,16	1,00	2,16	0,55	0,21	1,42
Triticale	2,41	1,07	2, 11	0,59	0,23	1,45
Spring barley	2,10	0,96	1,64	0,55	0,29	1,44
Oats	2,22	1,08	2,19	0,59	0,27	1,88
Rape seed	5,18	1,97	4,00	1,45	0,30	2,04
Peas	4,86*	1,35	3,24	1,68	0,41	2,11
Root and fodder crops						
Potatoes	0,39	0,14	0,66	0,26	0,07	0,41
Sugar beets	0,40	0,16	0,65	0,36	0,09	0,66
Maize	0,37	0,14	0,46	-	-	-
Clover	0,51*	0, 11	0,53	-	-	-
Alfaalfa	0,61*	0,14	0,56	-	-	-
Grass mixtures	0,50	0,14	0,58	-	-	-
Crop grass	0,51	0,14	0,59	-	-	-
Grassland	0,40	0, 11	0,49	-	-	-

* - it is assumed that papilionaceous take in 50-70% N through Rhizobium

Example (chapter D, item 62):

Crops grown on the farm: potatoes(2,5 ha, yield 250 dt), rye (3,0 ha, yield 40 dt), oats (2,5 ha, yield 30 dt) and maize for silage (3,0 ha, yield 350 dt).

Nitrogen intake = (2,5*250*0,39) + (3,0*40*2,16) + (2,5*30*2,22) + (3,0*350*0,37) = 1058 kg
Nitrogen/ 11 ha = 96 kg of Nitrogen from 1 hectare.

Phosphorus intake = (2,5*250*0,14) + (3,0*40* 1 ,00) + (2,5*30* 1 ,08) + (3,0*350*0,14) = 435 kg
Phosphorus/11 ha = 39 kg Phosphorus from 1 hectare.

Potassium intake = (2,5*250*0,66) + (3,0*40*2,16) + (2,5*30*2,19) + (3,0*350*0,46) = 1318 kg
Potassium/11 ha = 120 kg Potassium from 1 hectare.

Annex 6

Rates to convert yield into grain units

Plan or plant group	Yield unit	Following conversion into grain units
Cereals, buckwheat	100 kg grain	1,00
Rape seed	100 kg seeds	2,00
Legumes	100 kg seeds	1,20
Potatoes, sugar beets	100 kg tubers, roots	0,25
Maize for silage	100 kg green mass	0,12
Alfaalfa, clover, mixtures	100 kg green mass	0,14
Grass for fodder, pasture	100 kg green mass	0,13
Permanent grassland	100 kg hay	0,40

Example (chapter D, item 63):

Farm holding as in example 5,

Grain units from 1 hectare = 250 dt, potatoes*0.25 + 40 dt, rye* 1,0 + 30 dt, oats* 1,0 +
350 dt, maize *0,12 = 43,6 grain units per one hectare.

Nitrogen intake: 43,6*2,4 = 105 kg nitrogen from 1 hectare.

Phosphorus intake*:* 43,6*1,1 = 48 kg Phosphorus from 1 hectare.
Potassium intake: 43,6*2,6 = 114 kg Potassium from 1 hectare.
NOTE: as calculated here., the nutrient intake differs slightly from that in Annex 5 (for the same farm holding), but the differences are negligible.