Evolution of the Québec environmental regulations for agricultural operations

Robert Bertrand, manager
Richard Beaulieu, soils specialist

Direction des politiques des secteurs agricole et naturel
Ministère de l'Environnement et de la Faune
Edifice Marie-Guyart
675 Boul. Rene-Levesque Est, 8e étage, boîte 26
Québec, QC G1R 5V7
Canada

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1. Introduction

All environmental interventions are based on a historical and technical context. It is essential to understand this context before developing new standards.

To fully understand the development of the dossier, we will describe the context and evolution of the environmental regulations for agricultural operations. Along the way, we will identify the elements that influenced the outcome.

2. Geographical, climatic, hydrographical and agricultural context

In spite of its large land area, the agricultural and populated zones in Québec are concentrated within 300 km of each bank of the Saint-Laurence river. Many areas have an undulating topography due to the Appalachian mountains in the South and the Laurentians in the North.

Climate

The climate is characterised by four seasons. Annual precipitation totals 100 cm; close to 60% falls in the form of rains and snow between October and May. Thus the spring melt, which generally occurs over a few weeks, creates a surge of water that strongly contributes to the annual nitrogen loss, and particularly to losses of phosphorus, suspended matter and organic matter, via run-off and erosion.

Hydrographical features

The Québec territory is drained by an important hydrographic network. The cultivated territory has many watercourses and a number of lakes, in addition to wetlands such as marshes and swamps.

Because of the large water area, swimming, fishing, sailing, canoeing and other aquatic activities and enjoyed by a large part of the population. Thus the importance of a good water quality, particularly in the summer.

Agriculture

Our growing seasons are relatively short (generally from May to September) while the water table is still high and the annual precipitation are elevated (40 cm). Thus, to be able practise a more intensive agriculture, it is necessary to drain surface as well as subsurface waters in order to hasten the drying of the cultivated land in the spring. In both cases, this implies the reprofiling of watercourses and ditches. This has a non-negligible contribution in water transport towards watercourses which results in the deterioration of water quality.
Agricultural soils in Québec are generally acidic. The total cultivated area is approximately 2 million hectares, and can be divided into three large soil groups (Tabi et al., 1990). The soil textures in group 1 generally vary from clay to sandy loam, without coarse fragments. This group represents 45% of agricultural soils. Soils in group 2 are sandy; textures vary from sand to loam and some contain coarse gravelly fragments in depth. These soils represent 32% of agricultural soils. Finally, the soils in group 3 are almost all glacial till, with a texture that varies from sandy loam to silty loam. They contain coarse fragments, gravel, pebbles and rocks. This last group represents 23% of Québec’s agricultural soils.

The majority of these soils have a topography that varies from flat to low slopes (0 to 9 %). However, depending to the region, some soils have stronger slopes (up to 16 to 30%).

In general, the soils in the first group are moderately well drained to poorly drained, whereas the soils in the other two groups vary from rapidly to very poorly drained.

Nutrient content in agricultural soils is measured using the Mehlich-III method, which applies well to agricultural soils. The soils have a natural range between 15 and 60 kg/ha $P_{M3}$. However, the soils must be improved for modern production methods. Thus, according to data obtained in 1995 and 1996, the samples analysed (over 4000 samples) contained phosphorus levels which were generally much higher (Table 1).

Table 1  Distribution of soil samples according to phosphorus level analysed in 1995 and 1996

<table>
<thead>
<tr>
<th>Classification</th>
<th>Proportion of soil samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor (0 – 60 kg/ha $P_{M3}$)</td>
<td>28%</td>
</tr>
<tr>
<td>Average (61 – 120 kg/ha $P_{M3}$)</td>
<td>30%</td>
</tr>
<tr>
<td>Good (121 – 150 kg/ha $P_{M3}$)</td>
<td>9%</td>
</tr>
<tr>
<td>Rich (151 – 250 kg/ha $P_{M3}$)</td>
<td>17%</td>
</tr>
<tr>
<td>Excessively rich (251 kg/ha $P_{M3}$ and +)</td>
<td>16%</td>
</tr>
</tbody>
</table>

Moreover, when we consider the sample origin we observe the following tendencies: the majority of rich soils (151 – 250 kg/ha $P_{M3}$) and excessively rich soils (≥ 251 kg/ha $P_{M3}$) are found in regions with high animal density where corn acreage is high, whereas the majority of poor soils (0 – 60 kg/ha $P_{M3}$) and medium soils (61 – 120 kg/ha $P_{M3}$) are found in regions where the livestock density is much lower and fodder crops dominate.

*Crops production*

The crops grown on approximately 2 million cultivated hectares are divided as represented in the table 2.

Furthermore, the table 2 presents also the evolution of the area dedicated to the main agricultural crops grown in Québec. Overall, we note a decrease in area of hay field and
pastures, and an increase in surface area dedicated to annual crops (cereals, oilseed crops and corn).

Table 2  Cultivated areas in Québec – Main crops

<table>
<thead>
<tr>
<th>Crops</th>
<th>1995</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ha</td>
<td></td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>85 062</td>
<td>86 051</td>
</tr>
<tr>
<td>Hay fields</td>
<td>972 486</td>
<td>827 639</td>
</tr>
<tr>
<td>Pasture</td>
<td>396 270</td>
<td>305 066</td>
</tr>
<tr>
<td>Cereal and oilseed crops</td>
<td>397 007</td>
<td>442 634</td>
</tr>
<tr>
<td>Corn (grain)</td>
<td>302 254</td>
<td>412 288</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2 153 079</td>
<td>2 073 678</td>
</tr>
</tbody>
</table>

Source : Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec

Livestock production

Table 3 presents the evolution of the main types of livestock raised in Québec. Generally, we observe a decrease in the number of dairy cattle, but an notable increase in the number of pigs, sheep and fowl.

Table 3  Herd size of main livestock raised in Québec

<table>
<thead>
<tr>
<th>Species</th>
<th>1995</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Livestock units¹</td>
<td></td>
</tr>
<tr>
<td>Dairy cattle</td>
<td>643 698</td>
<td>575 160</td>
</tr>
<tr>
<td>Meat cattle</td>
<td>324 902</td>
<td>318 814</td>
</tr>
<tr>
<td>Pigs</td>
<td>563 857</td>
<td>677 632</td>
</tr>
<tr>
<td>Sheep</td>
<td>26 137</td>
<td>43 489</td>
</tr>
<tr>
<td>Fowl</td>
<td>173 213</td>
<td>219 002</td>
</tr>
</tbody>
</table>

Source : Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec

¹ See appendix 1.

3. Water

Water is generally abundant throughout the populated territory. However, human activities have affected the quality everywhere. For this reason, the Programme d’assainissement des eaux du Québec was launched in 1978. This program aimed to reduce the contaminant load in order that citizens might regain certain water use that have been identified. This program was intended for the municipal, industrial and agricultural sectors.
Water used for human consumption is drawn from rivers, lakes and the underground sources.

More than 80% of the Québec population rely on surface waters for domestic use. However, the underground water is used in close to 90% of the rural territory. Of course, a large part of the population draws its water from the Saint-Lawrence river (the Montreal region, Québec, etc.) but many Québec’s municipalities draw their water from lesser watercourses.

Water quality

Over time, human activities have decreased the quality. For this reason, there are occasional problems with nitrates, pesticides or coliforms. During a characterisation programme carried out in 2002, more than 2000 samples from 7 agricultural watershed were collected. Nitrate, *Escherichia coli*, enterococcus and coliphage type viruses were the parameters analysed. Results from this sampling campaign are not yet available.

Surface waters are regularly contaminated by phosphorus, suspended solid and coliforms. This situation is more frequent in regions where agriculture is relatively intense, in terms of both animal and crop production.

Livestock distribution does not by itself explain water quality. However, we must bear in mind that contamination occurs following soil losses or run-off contaminated by soils enriched by manure spreading and mineral fertilisation, and that soil enrichment occurs over a number of years when the amount of phosphorus added exceeds that which is removed by the crop.

4. Evolution of agricultural regulations

Since the beginning of the 1980’s, all adopted regulations have had a common goal: regain water use over all the territory. This objective also guided interventions in the municipal and industrial wastewater clean up program.

4.1 Regulation respecting the prevention of water pollution in livestock operations

This regulation came into effect in 1981 and was based on administrative standards for the management of livestock productions and on manure spreading. As the environmental portrait for Québec was incomplete, this regulation was based on that of states in the US which were more advanced in agricultural pollution control. Nitrogen was targeted.

For fertilisation, only animal waste was taken into account, and the allowed nutrient contribution had little to do with agronomic needs, crop yields, the characteristics of fields, soils and crops, as well as environmental thresholds.

As for the management of livestock operations, it was required that the farm had at its disposal sufficient spreading surfaces.
4.2 Regulation respecting the reduction of pollution from agricultural sources

Based on water quality data collected by the MENV (Ministère de l’Environnement) in the 1980’s, it was possible to measure the results of the decontamination efforts of municipal wastewater treatment plants, the installation of industrial waste treatment and the construction of numerous manure storage structures, principally for liquid manure.

In spite of these actions, the observed water quality did not attain the necessary quality to support the uses in demand. This situation is especially true in agricultural regions where livestock manure production exceeds the crop needs and where an important production of annual crops. We observed that environmental criteria for phosphorus were frequently exceeded, and by large amounts for many agricultural watercourses. Because of the major eutrophication impacts, intervention was deemed necessary. It was concluded that henceforth, the agricultural sector should contribute more strongly to water quality improvement (particularly for phosphorus).

Following these observations, it was evident that future interventions should be based on water quality goals. The Regulation respecting the reduction of pollution from agricultural sources (RRRPAS), published in July 1997, gave birth to standards based on technical concepts for the management of animal waste, farm composts and mineral fertiliser for animal production farms, and also for large crop productions most likely to have an environmental impact. The main parameters targeted were henceforth nitrogen and phosphorus.

The choice to manage fertilisation practices is based on a number of considerations:

- Fertilisation practices are necessary for almost all of the cultivated areas, and therefore crop production;
- Investments for almost all of the agricultural exploitations are minimal;
- Good management of fertilisers can reduce production costs;
- Good fertilisation practices should target all fertilising materials (manures, mineral fertilisers and others);
- Good fertilisation practices correspond to the agronomic objectives of agricultural producers (soil fertility, high yield of good quality);
- Use of the expertise of the agronomists is mandatory.

Specifically, fertilisation practices needed to be revised so that the phosphorus amounts that are spread corresponded to the needs of the crop.

To meet this objective, it was first necessary to:

- Control the livestock development on the territory, in order to avoid manure surpluses compared to available spreading areas;
- Control the input of mineral phosphorus fertilisers, in order to meet only the crop needs.
We observed that fertilisation standards based on nitrogen did not permit the control of environmental problems linked to phosphorus. This is because manure generally contains too much phosphorus relative to crop needs when manure spreading is dosed as a function of nitrogen crop need. As a result, the soil is unduly enriched, and enough phosphorus is lost to significantly deteriorate the quality of surface water.

Furthermore, a study evaluating the state of agricultural soils in Québec, prepared by Tabi et al. (1990), identified different soil degradation problems, particularly phosphorus over-fertilisation problems from farm and mineral fertilisers.

Finally, as the new regulations were drawn up, researchers such as Breeuwsma and Silva (1992) and Sharpley et al. (1994) identified phosphorus fertilisation practices as a significant contributor to the deterioration of water quality, particularly eutrophication.

Regulatory requirements

In general, the regulation identified requirements for livestock management and fertilisation. For fertilisation, mineral fertilisers were to be applied based on the crop needs in nitrogen and phosphorus. For animal waste management, the regulation fixed deadlines designed to limit livestock increase by periodically tightening animal waste fertilisation requirements, while drawing on the expertise of agronomists. Due to difficulties for the farmers to comply with respecting the recommended phosphorus doses, this approach was modified. Thus, the quantities spread were temporarily changed to return to the nitrogen crop needs. Progressively, the quantities of fertilising materials spread were supposed to be reduced to correspond to the quantities fixed as a function of the quantities exported by the harvest, as well as the phosphorus level and saturation in the soil. Furthermore, these requirements differed according to the type of production: those increasing their livestock herd were required to quickly reduce the quantities of phosphorus spread per surface unit (ha). Finally, fertilisation practices (spreading doses, periods and methods) must be planned as a function of the characteristics of the livestock fertilisers, crops, soils and other properties of the operation and specified in a agro-environmental fertilisation plant (EAFP).

In spite of these constraints, livestock continue to increase, and menaces the recovery of water use. Also, in June 2001, the requirements for expanding livestock operations were tightened in certain sectors. We therefore created a mechanism to limit the phosphorus charge by municipality. This was based on a phosphorus assessment that took into account the quantities of phosphorus exported and those produced by the livestock.

4.3 Agricultural operations regulation

The numerous changes to the regulation from 1997 through 2002 made it increasingly difficult to understand and apply the regulation (RRRPAS). Furthermore, it limited the possibilities and alternatives approaches of the producers and their advisors (agronomists
or engineers). Finally, it did not produce all of the desired environmental effects. Among others, we observed:

- A strong increase in the livestock herds, especially pigs, in municipalities already with high inputs;
- A displacement of the pig production to neighbouring municipalities;
- Cohabitation problems caused by citizens that judged the water and air to be inadequate;
- Increasing public demonstrations and pressure directed towards elected officials.

Regulatory requirements

The Agricultural operations regulation targets essentially the same agricultural activities, and the same environmental parameters as those of the RRRPAS, and the objective is unchanged. However, it is differentiated from its predecessor by many aspects. The most important is that in many cases, it fixes many results (objectives) while letting the agricultural contributor chose the means.

For fertilisation, the regulation manages all of the fertilising sources by putting the emphasis on phosphorus management. This is why it establishes maximum quantities (administrative thresholds) and environmental saturation thresholds for soil phosphorus that have to be respected (see in Appendix 2). It also determines a time table for the periodic tightening of fertilisation requirements, in order to limit the quantities of phosphorus that may be managed by an agricultural operation. The management of nitrogen must be based on the crop needs according to the recognised references guides, and is under the responsibility of the person who prepares the AEFP. This plan must be based on technical data from the agricultural operation and provide fertilisation recommendations respecting the Regulation.

For the management of livestock increases, the owner of the operations must have enough spreading areas at his disposal in order to comply with the regulation. This limitation is determined as a function of the parcel properties, the soil, the crops and the yields obtained. Finally, the Agricultural operations regulation (AOR) foresees a periodic revision of content to adapt to new agro-environmental discoveries.

Due to pressures from the rural population, it was deemed necessary to maintain a moratorium on pig production for a period of 18 to 24 months, according to the location. Moreover, the authorities judged it necessary to put into place a commission having the objective to investigate on pig production and propose solutions which would permit the sustainable development of this economic sector.

A new approach

The adoption of the AOR marked an important change. Beyond the adoption of a certain number of new standards, the regulation fixed environmental objectives rather than the specific agro-environmental practices. This means that the agronomist and farmer must
chose practices that will control the contamination with regards to the agronomic, economic and environmental situation of the enterprise. During this time, the Ministère de l’Environnement will visit the agricultural operations in order to establish their environmental situation and discuss necessary interventions. Also, a follow-up will done on the water quality to evaluate the effects of implemented agro-environmental practices.

This new approach is strongly based on the expertise of agronomists. With the adoption of the RRAO, the Ordre des agronomes du Québec increase its environmental involvement. Because of their mandate to protect the public, the Ordre must insure that the agronomist’s interventions take environmental quality into account in their recommendations. Thus, this organisation has resolved to:

- Insure that the agronomists are competent, with regards to fertilisation and agro-environment;
- Identify state-of-the-art rules for fertilisation and more;
- Fix the content of the agro-environmental fertilisation plans;
- Determine the nature of the interventions of an agronomist.

5. Phosphorus index

There are many ways to reduce the impacts of agricultural practices on the water quality in rural areas. The way chosen for the AOR is based on two main reasons: it gives the agronomist the liberty to chose the means, while fixing the objectives; it is also the result of an important consultation with the agricultural intervenants. The American approach based on the P index was considered, but not retained for the following reasons:

- The need to calibrate the model(s) as a function of certain soil properties and climatic considerations such as precipitation and snow melt;
- The need to develop computer based tools to facilitate the elaboration of the fertilisation plan by the agronomist;
- The effort needed to train the agronomists to use the P index.

6. Benefits derived from the regulation of agricultural activities

The main benefits derived from the regulation are environmental and agronomic. These may be divided into two categories: direct and indirect.

Direct benefits

To this day, we have observed:

- An important reduction in quantities of N, P and coliforms lost to agricultural watercourses from the storage of animal waste;
- Reduced ammonia contamination problems following the fall spreading of animal waste in certain municipalities that rely of surface waters for drinking water.
In the same vein, we can anticipate:

- A better protection or an improvement in the quality of surface and subsurface waters due to better fertilisation practices (doses, periods and spreading guidelines)

**Indirect benefits**

The main indirect benefits is the development of a significant expertise and a strong understanding of agro-environmental management of fertilising elements such as nitrogen and phosphorus by an appreciable number of researchers and professionals.

**Conclusion**

Even though a lot of work and progress has been made by each of the intervenants in the dossier of agricultural pollution in Québec, the success can be attributed to a number of elements including:

- The strong support of all of the intervenants in the agricultural sector for the regulatory objectives;
- Action for a large proportion of agricultural operations;
- An important change to agricultural practices and the development of animal production

The measures adopted thus far have their limits. To attain regulatory objectives, interventions will be needed for other agricultural practices. Thus, we will eventually have to focus on reducing run-off and water erosion.

**References**


Appendix 1

Calculation of livestock units

For the purposes of the Regulation respecting the reduction of pollution from agricultural sources, the following types of livestock are, in the numbers indicated, equivalent to 1 livestock unit:

1 cow
1 bull

1 horse
2 calves 225 to 500 kg each

5 calves under 225 kg each
5 breeding pigs 20 to 100 kg each

25 piglets under 20 kg each
4 sows, plus piglets not weaned within the year

125 hens or roosters
250 broiler chickens

250 growing pullets
1500 quails

300 pheasants
100 broiler turkeys 5 to 5.5 kg each

75 broiler turkeys 8.5 to 10 kg each
50 broiler turkeys 13 kg each

100 female minks (males and kits are not counted)
40 vixens (males and kits are not counted)

4 sheep, plus new-crop lambs
6 nanny goats, plus new-crop kids

40 does (rabbits) (males and nestlings are not counted)

Where a weight is indicated in this appendix, it refers to an animal’s anticipated weight at the end of the production period.

For any other livestock species, a weight of 500 kg is equivalent to 1 livestock unit.
Appendix 2

CHARTS OF MAXIMUM ANNUAL DEPOSITS FOR ALL FERTILIZERS USED ON A PARCEL ACCORDING TO THE CROP GROWN AND EXPRESSED IN KILOGRAMS OF TOTAL PHOSPHORUS (P2O5) PER HECTARE

CORN

<table>
<thead>
<tr>
<th>Phosphorus Content (kg P/ha)</th>
<th>Percentage of phosphorus saturation (P/Al)</th>
<th>Crop yields (MT/ha at 15 % humidity)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt; 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 à 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 9</td>
</tr>
<tr>
<td>0 – 30</td>
<td>—</td>
<td>140</td>
</tr>
<tr>
<td>31 – 60</td>
<td>—</td>
<td>130</td>
</tr>
<tr>
<td>61 – 90</td>
<td>—</td>
<td>120</td>
</tr>
<tr>
<td>91 – 120</td>
<td>—</td>
<td>110</td>
</tr>
<tr>
<td>121 – 150</td>
<td>—</td>
<td>100</td>
</tr>
<tr>
<td>151 – 250</td>
<td>&lt; 5</td>
<td>90</td>
</tr>
<tr>
<td>5 to 10</td>
<td></td>
<td>75</td>
</tr>
<tr>
<td>&gt; 10</td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>251 – 500</td>
<td>= 10</td>
<td>65</td>
</tr>
<tr>
<td>&gt; 10</td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>501 and more</td>
<td></td>
<td>40</td>
</tr>
</tbody>
</table>

CEREAL (OATS, WHEAT, BARLEY) AND SOYA MEADOWS AND PASTURES

<table>
<thead>
<tr>
<th>Phosphorus Content (kg P/ha)</th>
<th>Percentage of phosphorus saturation (P/Al)</th>
<th>Crop yields (MT/ha at 15 % humidity)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt; 2,5¹</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2,5 à 3,5¹</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 3,5¹</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 5²</td>
</tr>
<tr>
<td></td>
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<td>5 à 7²</td>
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<td></td>
<td></td>
<td>&gt; 7²</td>
</tr>
<tr>
<td>0 – 30</td>
<td>—</td>
<td>120</td>
</tr>
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<td>31 – 60</td>
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<td>61 – 90</td>
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<td>91 – 120</td>
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<td>90</td>
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<td>121 – 150</td>
<td>—</td>
<td>80</td>
</tr>
<tr>
<td>151 – 250</td>
<td>&lt; 5</td>
<td>70</td>
</tr>
<tr>
<td>5 at 10</td>
<td></td>
<td>55</td>
</tr>
<tr>
<td>&gt; 10</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>251 – 500</td>
<td>= 10</td>
<td>45</td>
</tr>
<tr>
<td>&gt; 10</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>501 and more</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

¹ Phosphorus content in milligrams per kilogram. ² Percentage of phosphorus saturation in milligrams per liter.
NOTES

1. This Schedule is used to calculate the minimum area required to comply with section 20 of the Regulation. The minimum area required corresponds to the areas necessary to dispose of the phosphorus (P$_2$O$_5$) load from the raising site from which the treated or removed phosphorus (P$_2$O$_5$) load in accordance with section 19 was subtracted. The load of any other fertiliser used in conjunction with livestock waste on cultivated parcels must be considered in the calculation of the minimum area in accordance with the conditions of this Schedule.

2. This Schedule refers to a total maximum deposit of phosphorus (P$_2$O$_5$) and not to a deposit of available phosphorus (P$_2$O$_5$). The deposit of phosphorus (P$_2$O$_5$) is based on the type of crops, crop yield, richness of the soil and phosphorus saturation rate of the parcel in question.

3. The values of maximum deposits are not fertilisation recommendations. An agrologist may, in an agroenvironmental fertilisation plan, recommend fertilisation for a given parcel greater than the value appearing in this Schedule.

        Notwithstanding the foregoing, if the total deposit recommended by an agrologist for all parcels and the years referred to in the agroenvironmental fertilisation plan is greater than the deposit calculated by using this charts, the agrologist designing the plan will have to specify in the plan the agrological and environmental reasons justifying the excess and inform the Minister thereof in writing.

        An agrologist must, through fertilisation recommendations, ensure that the level of soil saturation in phosphorus (P/Al) is lowered to a value less than 7.6% for soil with a clay content greater than 30% and to 13.1% for soil with a clay content equal to or less than 30% and that it is maintained below that value.

4. The deposit calculated using this Schedule is the sum of the deposits of phosphorus (P$_2$O$_5$) that may be spread on each of the parcels referred to in the agroenvironmental fertilisation plan. The deposit of phosphorus (P$_2$O$_5$) that may be spread on a parcel is obtained by multiplying the number of hectares of the parcel by the value indicated in this Schedule for the parcel in question.

5. In the absence of analysis of the soil specifying the richness of the soil and the phosphorus saturation rate of a parcel, it is possible to use the average value of the analyses of neighbouring parcels. If no analysis is available, the deposit value that must be retained is the value corresponding to a soil richness of 501 kg P$_2$O$_5$ / ha and more.
6. The crop yield for a given parcel is determined from the actual yields of the last five years in the following manner:

- for an agricultural operation where one crop is insured by an individual crop insurance program of La Financière agricole du Québec, the crop yield for the agricultural operation shall be used;
- for an agricultural operation where one crop is insured by a collective crop insurance program of La Financière agricole du Québec, the average value of the zone of the agricultural area shall be used; and
- or an agricultural operation where one crop is not insured by La Financière agricole du Québec, the operation’s crop yield measured according to a method recognized by La Financière agricole du Québec or the average value for the zone of agricultural area determined under the collective crop insurance program shall be used.

For an agricultural operation that operates parcels referred to in an agro-environmental fertilisation plan with types of crops that are not referred to in the chart, the maximum deposits of phosphorus (P₂O₅) on those parcels in particular shall be set by the agrologist designing the plan. The agrologist shall also specify in the plan the reasons justifying the values of the recommended maximum deposits.